SONY

HDC-500 Stand-alone System

HD COLOR CAMERA
HDC-500

HD CAMERA ADAPTOR
HDCA-50

HD CAMERA SIGNAL DISTRIBUTOR
HDCD-50

HD CAMERA REMOTE CONTROL UNIT
HDCR-50

HDVS

OPERATION MANUAL English
1st Edition (Revised 1)
Serial No. 10001 and Higher

For customers in the U.S.A.

WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

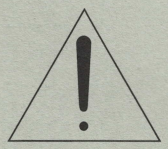
You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in Canada
This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

Pour les utilisateurs au Canada
Cet appareil est conforme aux normes Classe A pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

For HDCD-50
WARNING: Using this unit at a voltage other than 120 V may require the use of a different line cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Bescheinigung des Herstellers/Importeurs
Hiermit wird bescheinigt, daß die
HD-Farbkamera HDC-500
HD-Kameraadaptor HDCA-50
HD-Kamera-Fernsteuereinheit HDCR-50
HD-Kamera-Signalverteiler HDCD-50
in Übereinstimmung mit den Bestimmungen der BMPT-Amtsblatt Vfg 243/1991, Vfg 46/1992 funkentstört sind. Der vorschriftsmäßige Betrieb mancher Geräte (z.B.Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienugsanleitung.

Dem Bundesamt für Zulassungen in der Telekommunikation wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Name und Anschrift des Herstellers/Importeurs:
Sony Deutschland GmbH
Hugo Eckener Str. 20
D-5000 Köln 30

Hinweis
Gemäß der Amtsblätter des BMPT Nrn. 61/1991 und 6/1992 wird der Betreiber darauf aufmerksam gemacht, daß die von ihm mit diesem Gerät zusammengestellte Anlage auch den technischen Bestimmungen dieser Amtsblätter genügen muß.

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About this Manual

This manual is provided as a guidebook for users of the stand-alone system of the Sony HD (high definition) color camera system. This section covers the purpose and organization of the manual. Reading this first will help you decide to which of the other chapters you should devote the most time, depending on your experience with professional color camera systems.

Purpose of this manual

This manual contains all the information you need to operate the stand-alone system (also called "the system" in this manual), including the names and functions of the component parts, details of necessary preparation work, settings and adjustments, the procedures involved in recording using an external VTR, and the general operation. Also, this manual contains all necessary information required to make use of other features of the system, such as how to install optional accessories.

The system is also supplied with a maintenance manual in addition to this operation manual. Read the maintenance manual for details of how to use the troubleshooting functions, internal circuits, internal switches and so on.

Intended readership

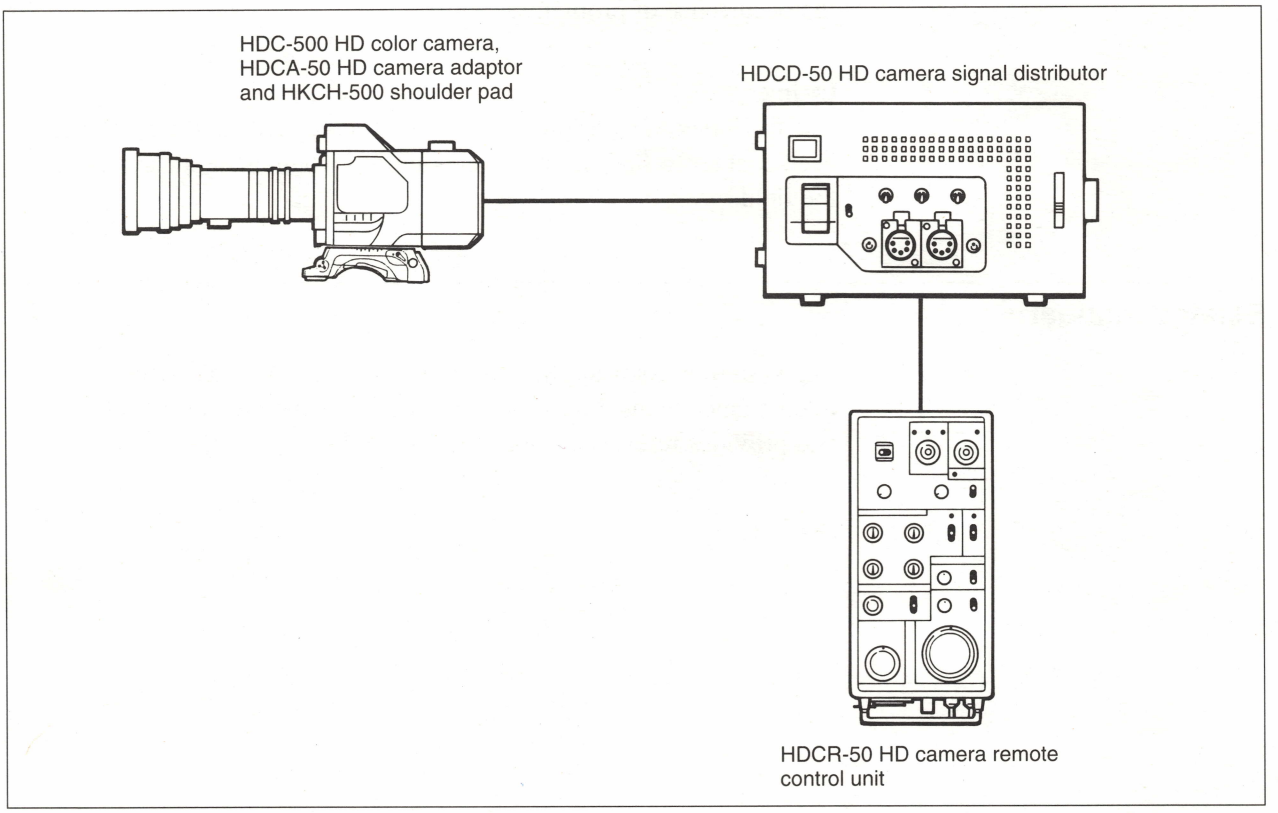
The manual is aimed at professionals such as camera engineers and video engineers at broadcasting stations or production houses. The manual is written assuming that the user has experience of broadcasting equipment. If you are an experienced user of broadcasting equipment, reading "6-1 Location and Function of Parts and Controls" will provide you with enough background to grasp the principal functions of the system. If you have limited experience in broadcasting equipment, you should preferably read through the entire manual. The Glossary at the end will help you understand the meaning of the technical terms used herein. The precautions you must observe when using your system are given in "2-1 Precautions on Use." Read this chapter regardless of whether you are professional or beginner.

Conventions used in the manual

Component names

The following abbreviations may be used in this manual to indicate each component and part of the camera system.

Type	Operating manual indication
HDC-500	Camera head/camera
HDCA-50	Camera adaptor/adaptor
HDCD-50	Signal distributor/distributor
HDCR-50	Remote control



Component names

Technical terms

Technical terms are explained in the body of the text wherever they first appear, or at the foot of the page. You may also consult the glossary of terms at the end of the manual.

Cross references

Throughout the manual you will find italicized references to sections of the manual that contains supplementary information.

Important notes

Be sure to read the sections of the manual marked **Note** . They explain points that you should be aware of to operate the system correctly and prevent malfunctions. Also, read "2-1 Precautions on Use" to ensure satisfactory operation, prevent malfunctions and avoid the occurrence of problems.

Index

Use the index in addition to the tables of contents and the first page of each chapter to find information you need when using the system in the field.

Related manual

The system is also supplied with a maintenance manual. The maintenance manual describes the necessary maintenance operations and provides relevant technical information.

Organization of this manual

The following is a brief summary of the chapters and appendixes constituting this manual. Note, however, that the first page of each chapter also summarizes the contents of that chapter.

Chapter 1 Overview
Describes the principal features and functions of the system.

Chapter 2 Installation
Describes system installation and connection. Also described are safety precautions that you should be aware of. Read this chapter regardless of whether you are professional or beginner.

Chapter 3 Setting Up
Describes the settings and adjustments to be done prior to recording.

Chapter 4 Recording
Describes the basic operation procedures for starting/stopping of recording and INCOM (intercom) operation.

Chapter 5 Operation of HDCR-50 Remote Control Unit
Describes operation with the HDCR-50 HD remote control unit.

Chapter 6 Appendixes
Gives the names and functions of the controls and other parts. Also, provides the following information:
- Warning system
- Specifications
- Glossary

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An alphabetical list of words used in this manual.

Chapter 1 Overview

This chapter describes the special features and system configuration that you should be aware of prior to operating the unit.

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1-1 Introduction to the System

This system is an OB (outside broadcast)/studio HD color camera (HDC-500) stand-alone system designed for relay or recording HD broadcast programs outside or with a relay van/OB van.

Application

This system is designed for producing high-quality HD images. It features full operational facilities to cover all shooting applications shown below.

- Broadcasting/producing HD broadcast programs in production studios and houses.
- Producing presentation/promotional video programs
- Producing commercial films
- Shooting art objects
- Medical research systems such as an operating microscopes
- Producing movie films
- Computer graphics systems
- Printing systems

Description of the camera

HAD sensor

The camera incorporates three of 2 million pixel 1-inch FIT type Hyper HAD[1)] sensor CCD (Charge Coupled Device). This CCD reduces noise, smearing and after-images. It also eliminates highlight burn-in, ensuring high picture quality. The application of conventional HD color camera system to the movie production field has been limited because of problems of after-images and highlight burn-in. However, this system can be applied to movie production field as well as broadcasting.

High sensitivity, less smearing and high S/N

The FIT type Hyper HAD sensor CCD enables reduced smearing, high sensitivity and a high signal-to-noise ratio. High sensitivity allows you to shoot subjects in dark surroundings, even under severe shooting condition where the light for the camera is inhibited, such as opera relay broadcasts. Also, the reduction of smear allows you to shoot subjects under bright lighting.

1) **Hyper HAD:** Hyper Hole-Accumulated Diode
Hyper HAD ™ is a registered trademark of Sony Corporation.

Light-weight and compact

Use of the CCD also allows the camera to be small and lightweight and have low power consumption. By separating the camera head from the camera adaptor, the system can be used as a stand-alone system. Thus, this compact system can be used for field production, where the camera is carried with a shoulder pad, in addition to the application of the system to studio work and movie production where the camera is used with a tripod.

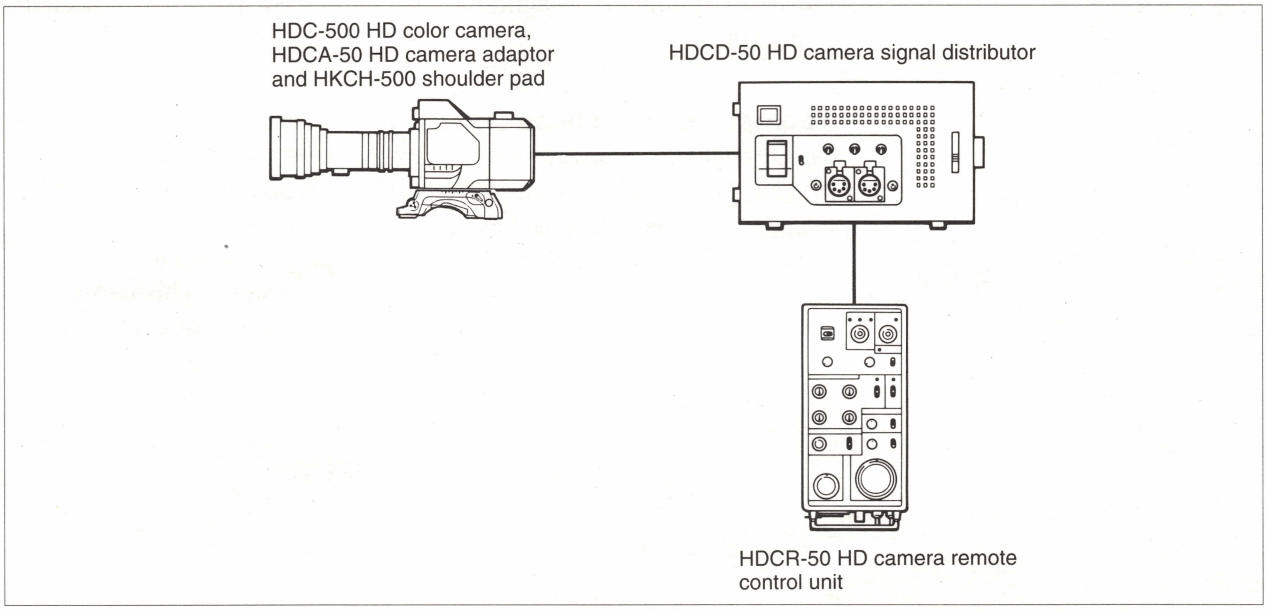
System description

The HDCA-50 HD camera adaptor contains an SMPTE 240M SG (signal generator). The adaptor processes and outputs the video and audio signals from the HDC-500 HD color camera. Thus, combining the HDCA-50 and HDC-500 produces a stand-alone HD camera system. By connecting the HDCD-50 HD camera signal distributor to the system via the HDCZ cable, the system can also act as a production system that supplies power, distributes signals, and inputs external sync signals, return video signals, and INCOM signals. Remote control operation is also possible with the HDCR-50 HD camera remote control unit or HDCR-350 HD camera remote control panel.

System configuration

This system consists of the following units.

- HDC-500 HD color camera
- HDCA-50 HD camera adaptor
- HDCD-50 HD camera signal distributor
- HDCR-50 HD camera remote control unit



System configuration

1-2 Features

1-2-1 Features of the HDC-500 HD Color Camera

Performance features

High sensitivity

Use of the FIT type Hyper HAD sensor CCD enables high sensitivity. The sensitivity is three times better than that of a conventional unit (Sony HDC-300). Thus, you can shoot dark scene, such as an opera stage, where previously it was difficult to shoot because the limited camera light.

High signal-to-noise ratio

By using the HAD sensor, dark current noise is reduced. Reduction of the dark current results in a corresponding reduction in the fixed pattern noise and a high signal-to-noise ratio. The signal-to-noise ratio is three times better than that of a conventional unit (HDC-300).

Reduction of smear

The FIT type CCD enables the system to minimize smearing. Thus, you can shoot a subject or scene under the bright lighting conditions.

Mechanical features

Compact, light-weight and strong

The camera is 40% smaller and 30% lighter, compared with a conventional unit (Sony HDC-300). Thus, the unit can be easily applied to outdoor shooting as well as the studio use.
The cabinet mechanism features a strong monocoque design, built mostly of aluminum. Magnesium is used in those parts not subjected to heat radiation.

Separate camera head and camera adaptor

To satisfy the user's wide-ranging applications and to construct systems best suited to those applications, the camera head and camera adaptor have been designed as separate units. You can use the unit by carrying it on your shoulder for producing programs and as the part of a medical study system or computer graphics system. This two-part design allows the camera to be applied to wide range of applications.

Interface features

Support of 1-inch lens

You can use the 1-inch lens designed for the HDC-300 system.

Operation features

Low optical axis height

In addition to the unit's compactness and light weight, its low optical axis mechanism offers you a variety of shooting styles.

Carrying handles

Grip for low-angle shooting

You can carry the unit by holding this grip. Also, you can shoot a subject from low angles by holding the unit with this grip.

Accessories

You can attach accessories, such as a light, to the unit's 1/4-inch screw tap.

Superior operation

You can attach a carrying strap. You can easily attach and remove the camera head. By also using the shoulder pad, you can carry the unit on your shoulder as a part of a multi-camera system.

Tripod attachment

Superior operation

The tripod adaptor allows you to attach the unit to any tripod on the market. You can attach the camera head to the tripod and remove the the unit from the tripod easily. You can also use the tripod as a base for attaching peripheral accessories.

Mount for 7-inch viewfinder

The unit is provided with a mount for attaching a large 7-inch viewfinder. This is used when the unit is applied to studio/OB production systems.

1-2 Features

1-2-2 Features of the HDCA-50 HD Camera Adaptor

Mechanical features

Separate camera head and camera adaptor

To enable a single camera to be applied to various systems/uses, the camera head and the camera adaptor are separated. You can use the unit by carrying it on your shoulder and as the part of a medical study system or computer graphics system. They can easily be connected or disconnected in the field.

Rotatable camera connector block

The camera connector block is rotatable to save space and to enable easy connection or disconnection of connectors.

Interface features

Connector for a monochrome monitor

The unit is provided with a connector for a monochrome monitor to enable monitoring in the field. You can monitor any one of G/B/R/Y signals.

DC OUT connector

The unit is provided with a DC OUT connector for the power supply of the script lamp.

INCOM (intercom connector)

The unit is provided with an INCOM (intercom) connector for the video engineer/tracker/focus puller.

Connector for VTR or HDCD-50 camera signal distributor

This connector interfaces the HDCA-50 camera adaptor with the HDCD-50 camera signal distributor. It outputs video signals, microphone audio signals, and power, and inputs external sync signals and return video signals. This connector also enables interfacing of commands and bidirectional INCOM (intercom) operations.

Viewfinder Connector

The unit is provided with a connector for any of the HDVF-30 (3-inch), HDVF-150 (1.5-inch), or HDVF-500 (5-inch) viewfinders. The connector supplies power to the connected viewfinder.

DC IN connector

The unit is provided with a DC IN power supply connector for operating the camera from a battery pack or external DC power supply.

Manual setup system

Shutter speed setting

You can select a shutter speed between 1/60.4 second and 1/350 second or any of 1/100, 1/125, 1/250, 1/350, 1/500, 1/1000 or 1/2000 second, according to the speed of the subject.
This function reduces blur. It is particularly effective for slow motion and stop motion at sports relay broadcast.

Frame/field reading functions

Frame/field mode means the CCD readout mode.

Frame mode

Frame mode is effective for shooting still subjects.
In frame mode, the CCD stores the signal in units of frames and changes the line to read the signal every field. In this mode, the CCD reads the signals completely every line, so that the high vertical resolution is obtained. In frame mode, however, the vertical resolution degree is improved, but the movement resolution degree is reduced.

Field mode

Field mode is effective for shooting fast-moving subjects.
In field mode, the CCD stores the signals in units of fields and outputs signals by adding two lines to the top and bottom of the vertical transfer CCD. (Conventional CCD cameras employ the field mode.) The combination of the two lines to be added is changed every field. Since the signals are stored in units of fields, fast-moving subjects are shot with less blur. In field mode, however, two lines are added unlike the way in which the input signal is read out as it is in frame mode. Thus, the vertical resolution degree is dropped compared with frame mode. In field mode, the sensitivity is improved and the vertical area ring is reduced. The vertical resolution, however, is reduced.

Super EVS (Enhanced Vertical Definition System)

Super EVS improves the vertical resolution of a moving subject.
In field mode of CCD readout mode, charges accumulated by adjacent lines, used in pairs, are added. Super EVS is used basically with field mode. However, with super EVS, the charges accumulated by adjacent lines, used in pairs, are not simply added before readout. By setting the addition ratio of adjacent lines in pairs, according to the movement of the subject, the vertical resolution is improved, compared with in field mode.
After-image improvement is such that it is the same as in field readout mode. Vertical resolution improvement is such that it is the same as in frame readout mode. The sensitivity, however, drops by up to 1/2 in inverse proportion to the vertical resolution. This is because the charge accumulated by adjacent lines is less than that in field mode. Thus, you can select a vertical resolution improvement ratio from among seven ratios (0.125/0.25/0.375/0.5/0.675/0.75/0.875), according to the subject.

1-2-3 Features of the HDCD-50 HD Camera Signal Distributor

Interface features

Two G/B/R (or Y/PB/PR) outputs

The unit is provided with two G/B/R (or Y/PB/PR) output connectors that can be flexibly assigned to the switcher, VTR, monitor, NTSC down converter and so on.

Return video inputs

The unit is provided with return video input and loop-through connectors: they are connected to the program output connector of the switcher or to any desired video input, according to your purpose. They can be used as loop-through connectors for other unit.

Connection to the HDCR-50 camera remote control unit

You can connect the HDCR-50 remote control unit or the HDCR-350 remote control panel so that remote control operation is possible.

Genlock connectors

The unit is provided with genlock and loop-through connectors so that genlock in the multi-camera system or synchronization with a frame memory recorder is possible.

Two-wire/four-wire INCOM (intercom)

You can connect the unit directly to an RTS system and to a ClearCam system via the TW-12 interface, for two-wire type. You can connect a four-wire intercom via the 19-pin INCOM/ TALLY/PGM connector.

CAMERA connector

The unit is provided with a CAMERA connector for the HDCA-50 camera adaptor. By using the HDCZ-10/25 multi-core camera cable, the camera adaptor can be placed up to 100 meters (238 ft) from the unit.

VTR connector

The unit is provided with a connector for a portable VTR or another HDCD-50 acting as a cable repeater. The connector outputs signals that have been corrected by the HDCD-50.

1-2-4 Features of the HDCR-50 HD Camera Remote Control Unit

Manual setup system

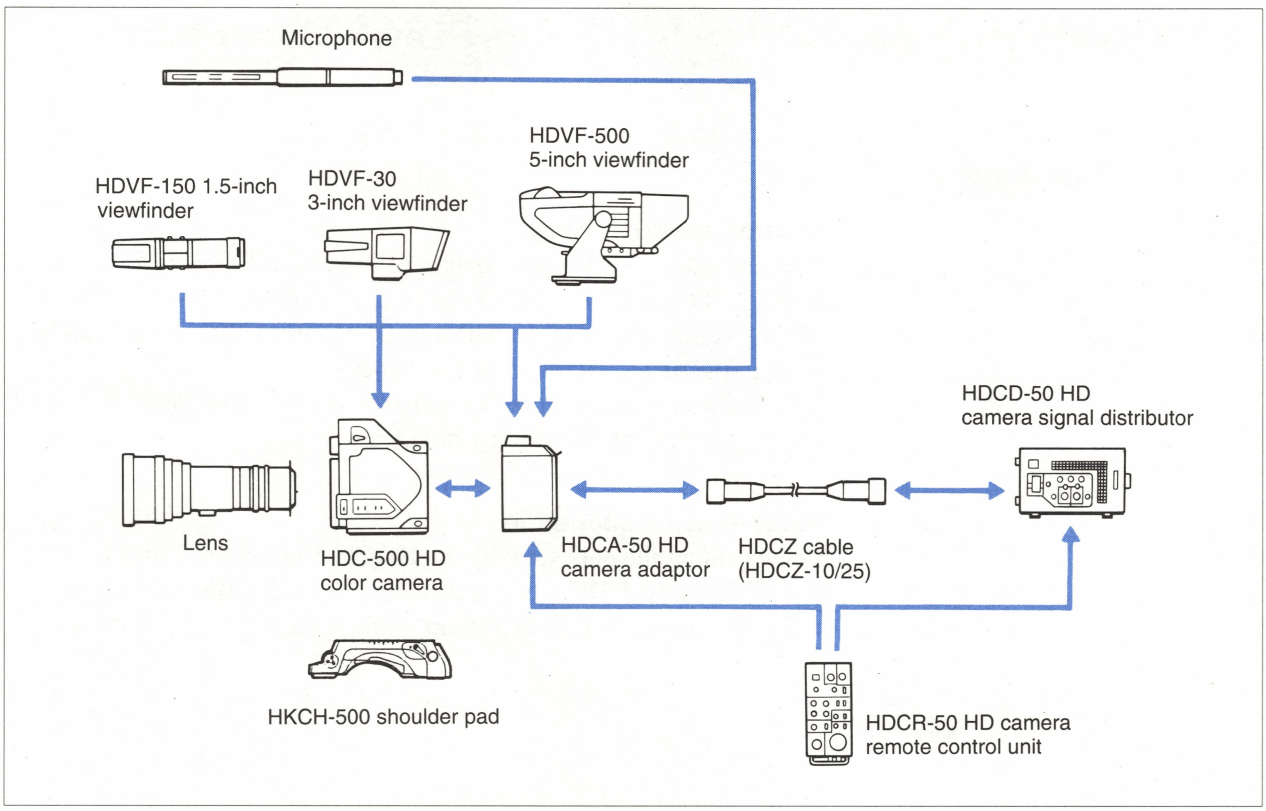
Shutter speed setting

You can select a shutter speed between any of 1/100, 1/125, 1/250, 1/350, 1/500, 1/1000 or 1/2000 second, according to the speed of the subject. (Fine shutter speed between 1/60.4 and 1/350 second can be set with the menu operation of the camera.)
This function reduces blur. It is particularly effective for slow motion and stop motion at sports relay broadcast.

Registering a scene file

You can store the data set with the HDCR-50 remote control unit to a scene file on the HDCA-50. You can retrieve this file even when using the camera as part of a stand-alone system.

1-3 Example System Configuration



System application example

Chapter 2 Installation

This chapter describes system installation and connections. Also described are safety precautions that you should be aware of. Read through this chapter regardless of that you are experienced person or beginner.

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2-1 Precautions on Use

Handling precautions

Protect from impacts.

Do not drop the unit or subject it to severe shocks.

After you finish

Turn off the system power.

Location

Do not store or use the unit under any of the following conditions.

- In excessive heat or cold; permissible temperature range: 0 °C to 40 °C (32 °F to 104 °F).
- In damp or dusty locations
- In locations subject to vibration
- Near strong magnetic fields
- In direct sunlight or near heaters.

Transporting

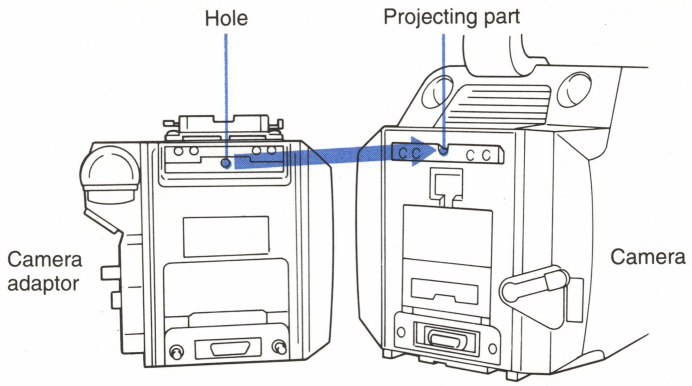
Protect the unit from impacts by transporting it in its original carton or a protective case.

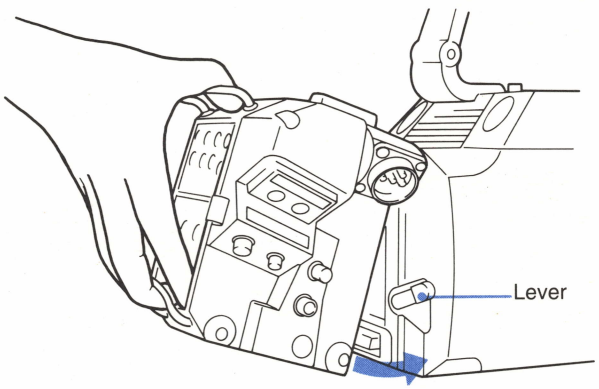
2-2 Attaching

2-2-1 Attaching/Detaching the Camera Adaptor

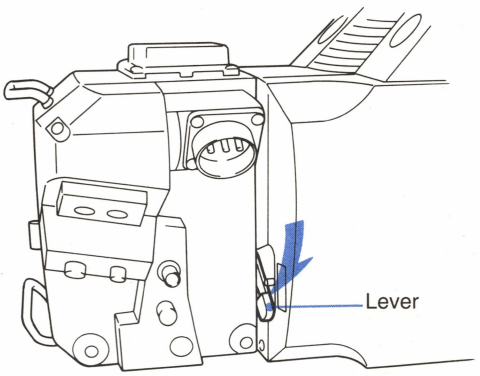
Attaching the camera adaptor

1 Insert the projecting part into the hole.
The lever is prelocked when you hear a click.



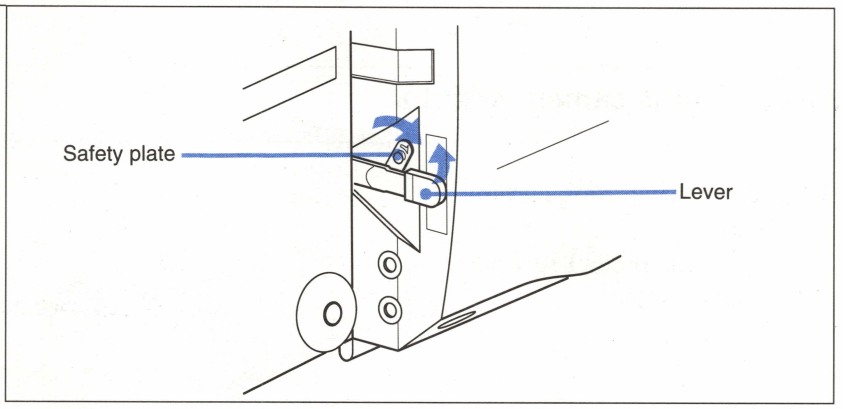


2 Move the lever in the direction of the arrow to fix it.



Detaching the camera adaptor

While moving the safety plate down in the right direction, move the lever up (keep the lever as it is up) and detach the camera adptor.

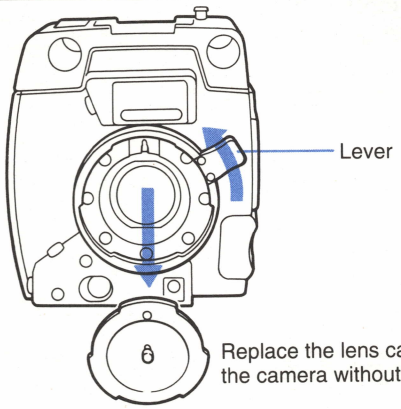


2-2-2 Mounting/Removing the Lens

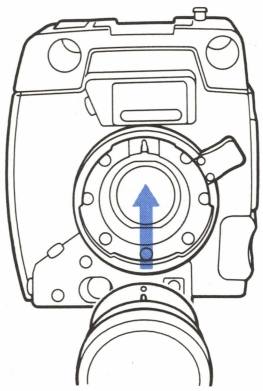
For details of how to handle the lens, refer to the operation manual for the lens you are using.

Mounting the lens (portable lens)

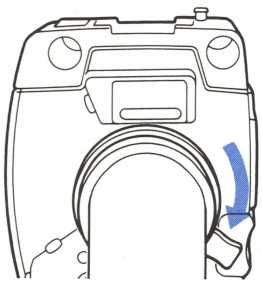
1 Turn the lever fully countercolckwise, then remove the lens cap.



2 Align the lugs with the breaches and insert.



3 Turn the lever fully clockwise to fix the lens.



Removing the lens

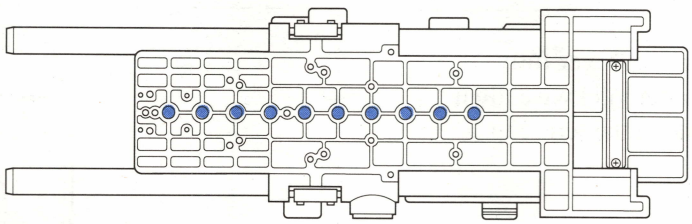
Removing the lens is the reverse of mounting the lens.

2-2-3 Attaching/Detaching the Tripod Attachment and the Tripod

Attaching the tripod attachment

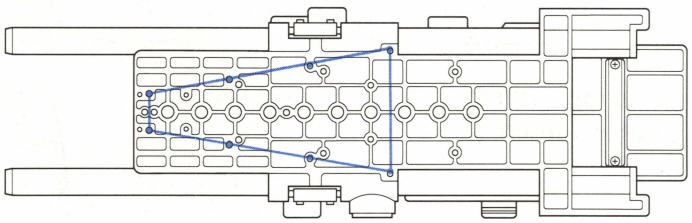
1 Mount the V-wedge (supplied with the tripod) on the tripod attachment.

Vinten type



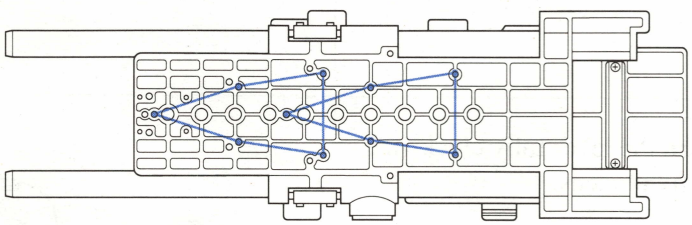
Use a 3/8-inch screws (not supplied).

Shotoku type (TE-02/06)



Use a M5 x 12 cap screws (not supplied).

Shotoku type (TE-05)



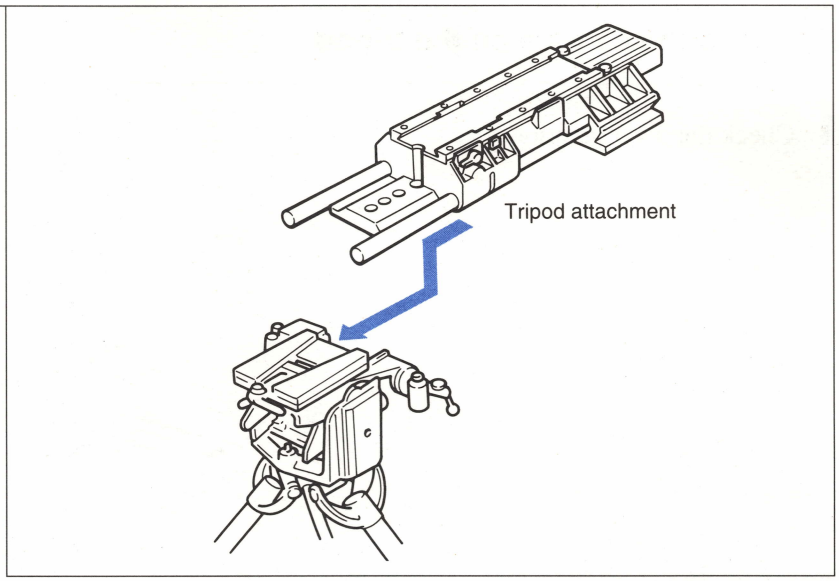
Use a M5 x 12 cap screws (not supplied).

When not using the V-wedge

The tripod attachment can be mounted on the tripod without the V-wedge.

Use $^{3}/_{8}$-inch screws (not supplied).

2 Mount the tripod attachment on the tripod.

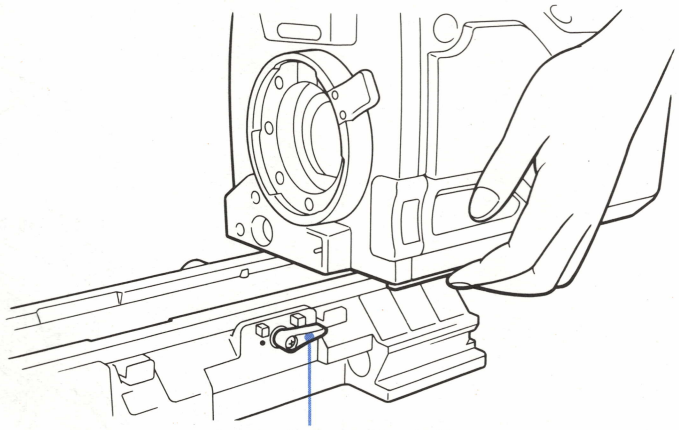


Detaching the tripod attachment

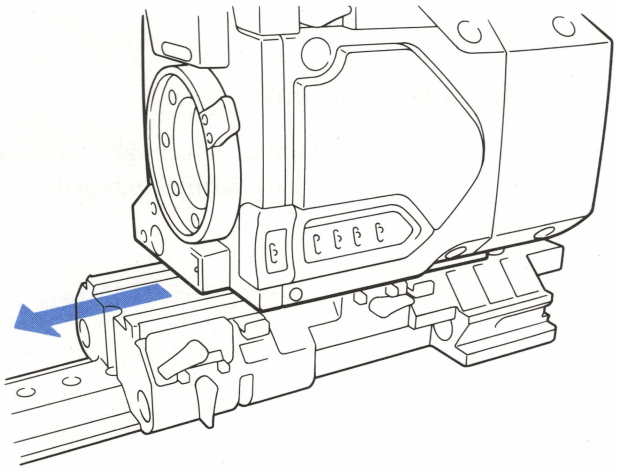
Turn the lever clockwise and remove the tripod attachment from the tripod, while holding down the release button.

Mounting the camera on the tripod

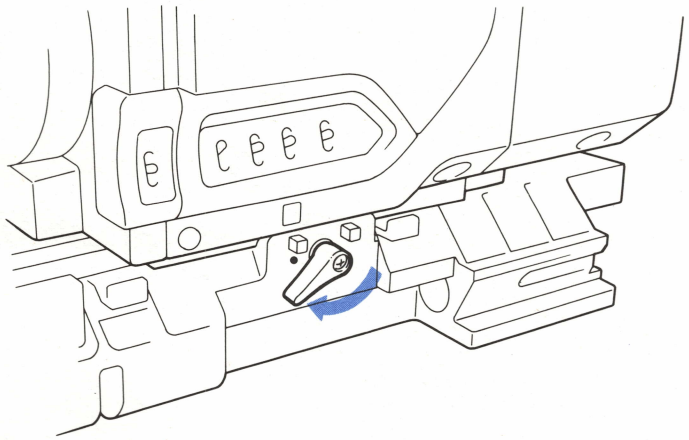
1 Check the lever position.



2 Slide the camera head forward along the groove until it stops.

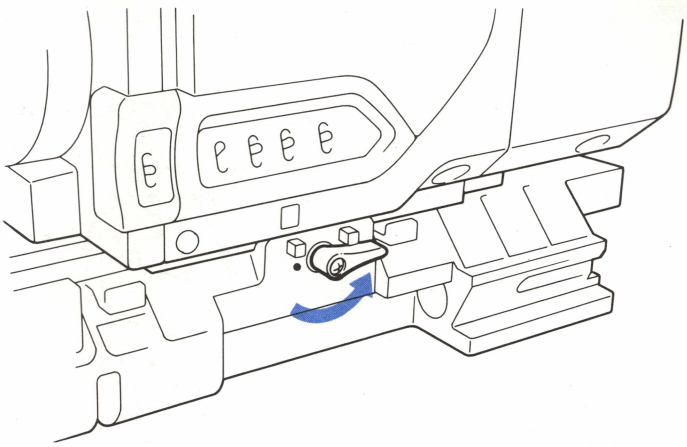


3 Turn the lever in the direction of the arrow to fix it.

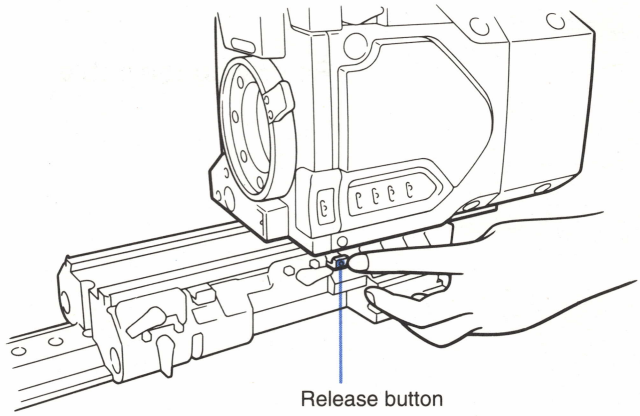


Removing the camera

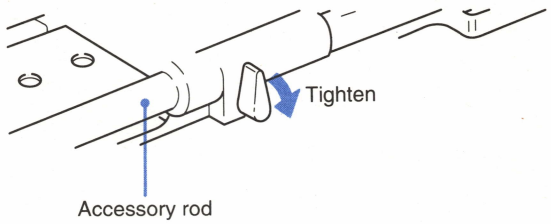
1 Turn the lever in the direction of the arrow.



2 While holding down the release button, remove the camera in the direction of the arrow.

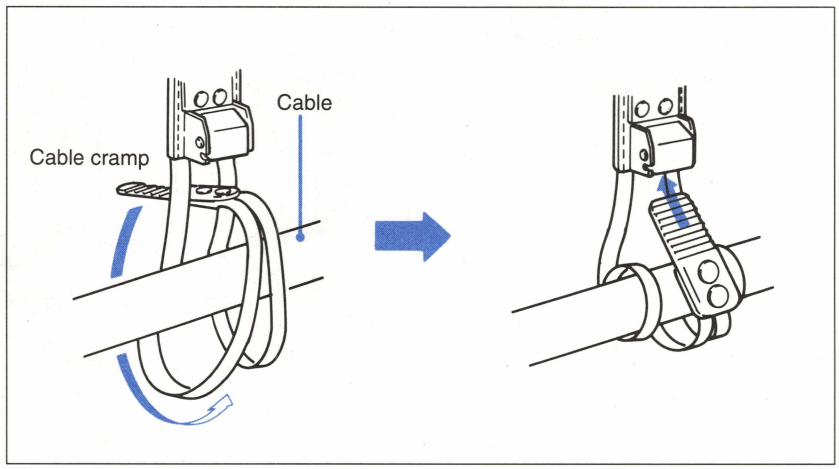


Tightening the accessory rod

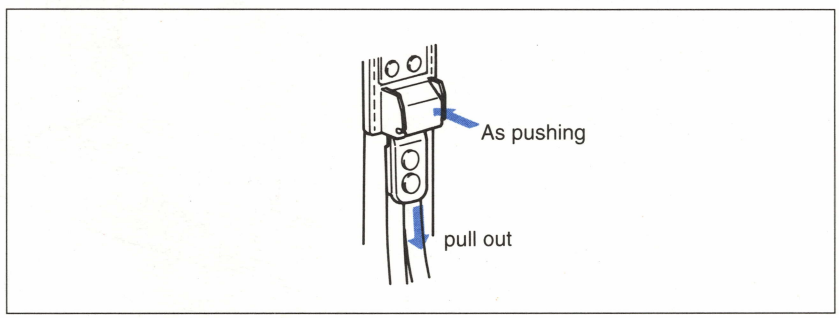


Using the cable clamp

Use the cable clamp to secure the cable to the tripod attachment.



Removing the cable

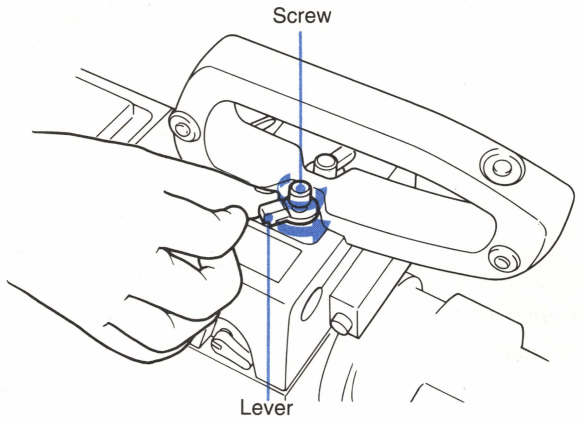


2-2-4 Attaching/Detaching the Handle

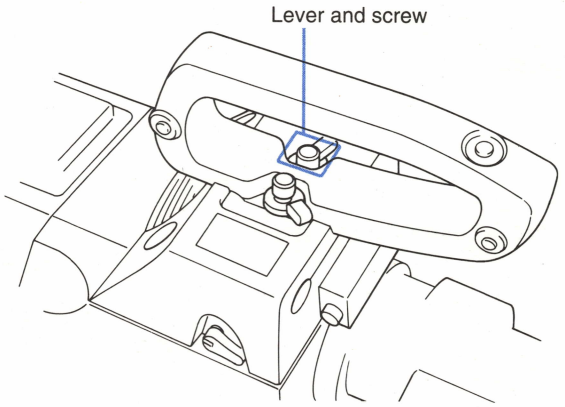
Remove the handle before mounting the 7-inch or large size viewfinder to the camera.

Detaching the handle

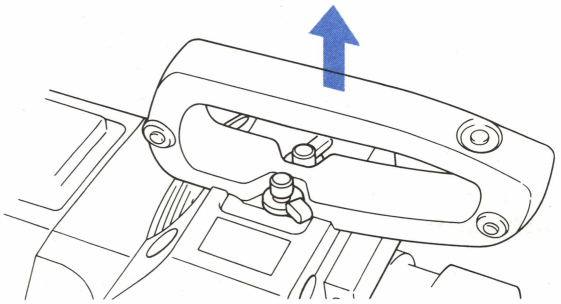
1 Rotate the lever and the screw in the direction of the arrow.



2 Rotate the other lever and the screw in the direction opposite to that in step **1**.



3 Remove the handle.



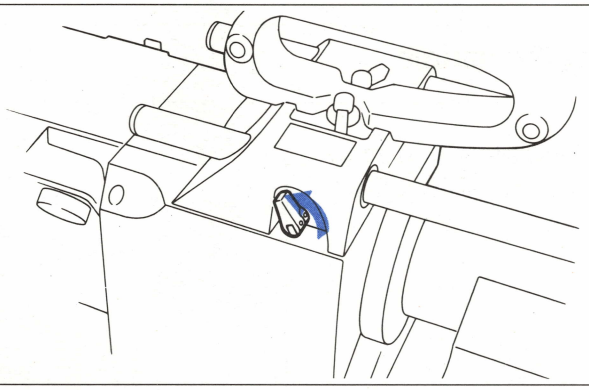
Attaching the handle

Attaching the handle is the reverse of removing the handle.

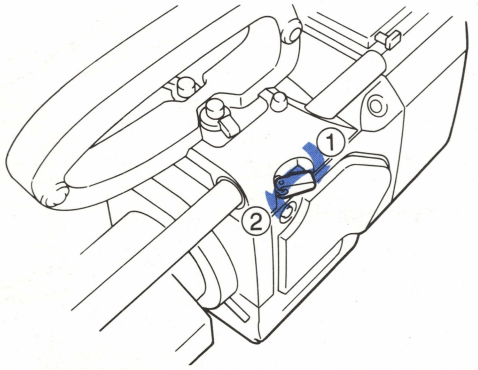
2-2-5 Attaching/Detaching the Accessory Rods

Detaching the accessory rods

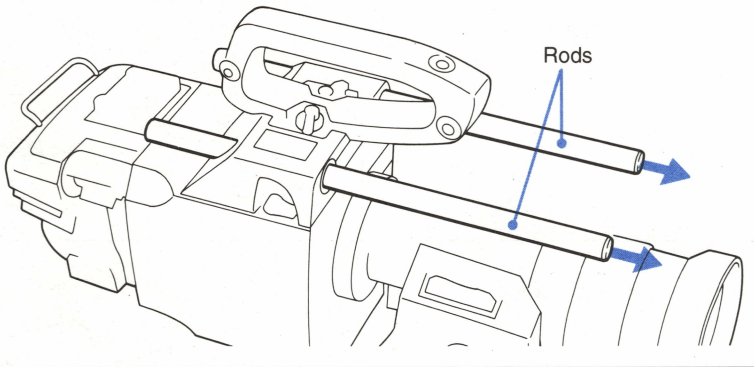
1 Rotate the lever in the direction of the arrow.



2 Pull the other lever clockwise ①, then rotate it to the lens side ②.



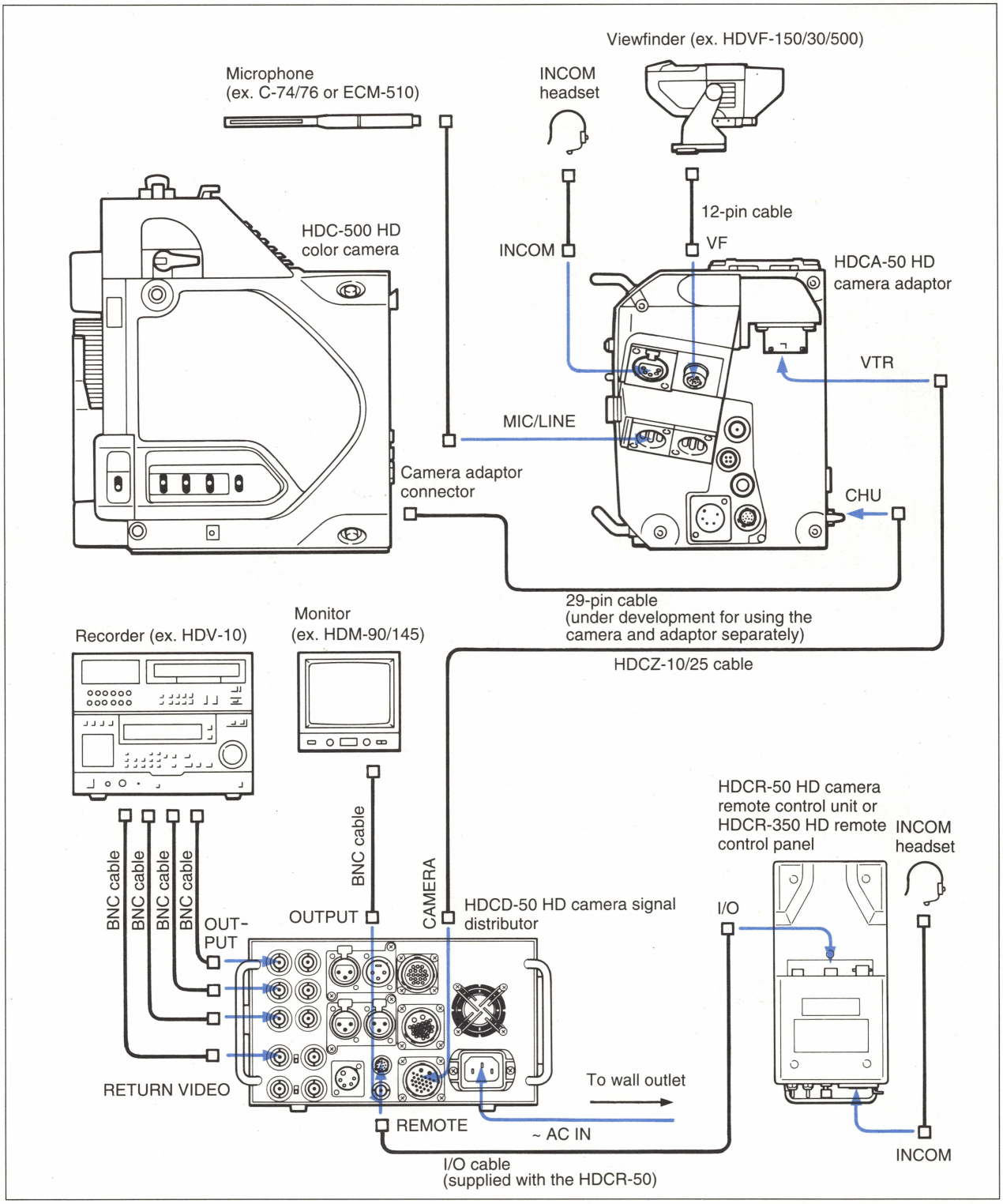
3 Remove the accessory rods.



Attaching the rods

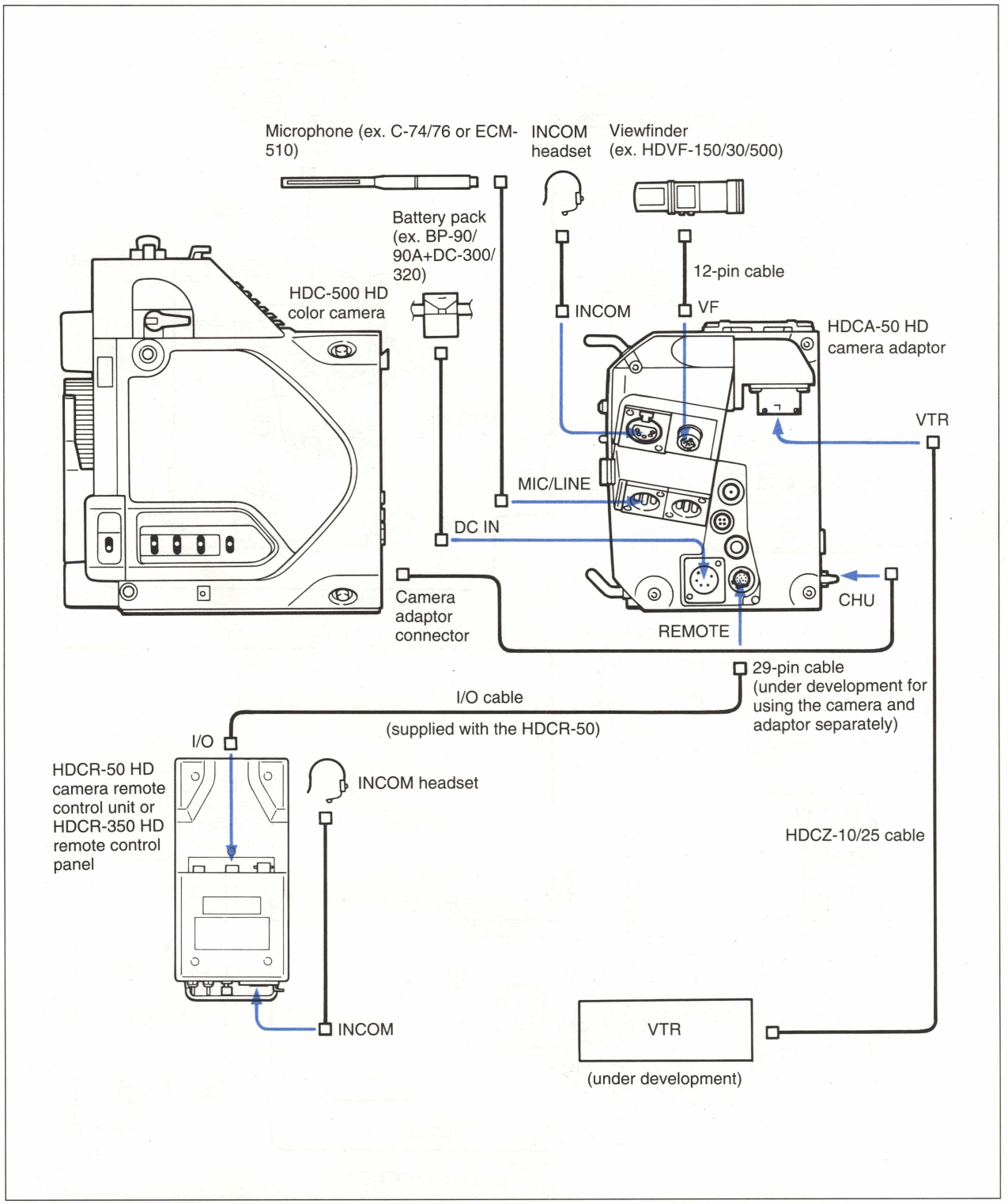
Attaching the rods is the reverse of detaching the rods.

2-3-1 Example Basic System Connection



Example basic system connection

2-3-2 Example Connection without the Signal Distributor



Example connection without the signal distributor

Chapter 3 Setting Up

This chapter explains how to start the system, how to switch the output signal, how to operate menus, and details about the settings and adjustments that must be made before recording.

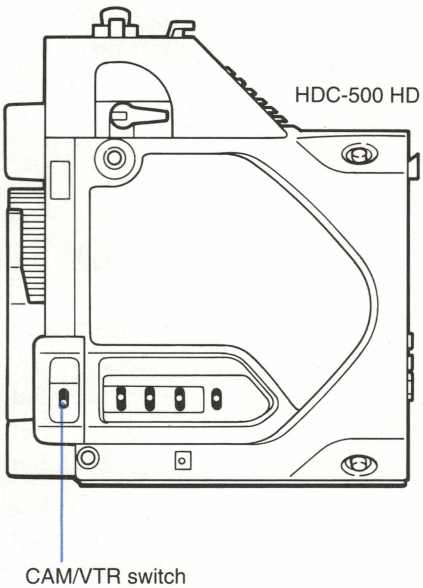
3-1 Starting the System (HDC-500, HDCA-50, and HDCD-50) 3-2
3-1-1 Turning the Power On/Off 3-2
3-1-2 Turning the Electronic Shutter On/Off 3-6
3-1-3 Switching the Camera Output Signal/ Color Bar Signal 3-7
3-2 Basic Setting Up (HDC-500, HDCA-50) 3-8
3-2-1 Switching the Filter 3-8
3-2-2 Setting the Gain 3-9
3-2-3 Setting the Shutter Speed 3-10
3-2-4 Setting the AUTO Knee (DCC ON/OFF) 3-12
3-2-5 Calling the File 3-13
3-3 Basic Adjustment (HDC-500, HDCA-50) 3-14
3-3-1 Automatic Black Balance Adjustment 3-14
3-3-2 Automatic White Balance Adjustment 3-17
3-4 Auxiliary Adjustment (HDCA-50, HDCD-50) 3-20
3-5 Menu Operation (HDC-500) 3-22
3-5-1 Menu Set-Up Item 3-22
3-5-2 Menu Operation 3-24

3-1 Starting the System

This section explains how to start the system.

3-1-1 Turning the Power On/Off

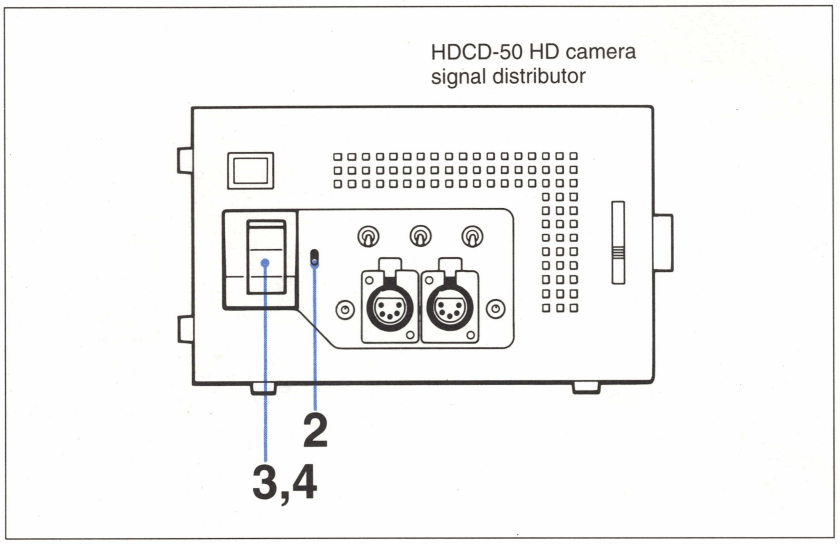
You can turn the camera power on and off either from the signal distributor, the camera adaptor, or the remote control unit. To minimize the power consumption, set the CAM/VTR switch of the HDC-500 color camera according to the shooting condition.



Turning the power on/off

Switch setting	The camera power is	When you want to
CAMERA SAVE	Turned off.	• pause shooting.
CAMERA ON	Turned on.	• perform setup. • minimize the drain on the battery.

Turning the camera on and off from the camera signal distributor



Turning the power on/off from the distributor

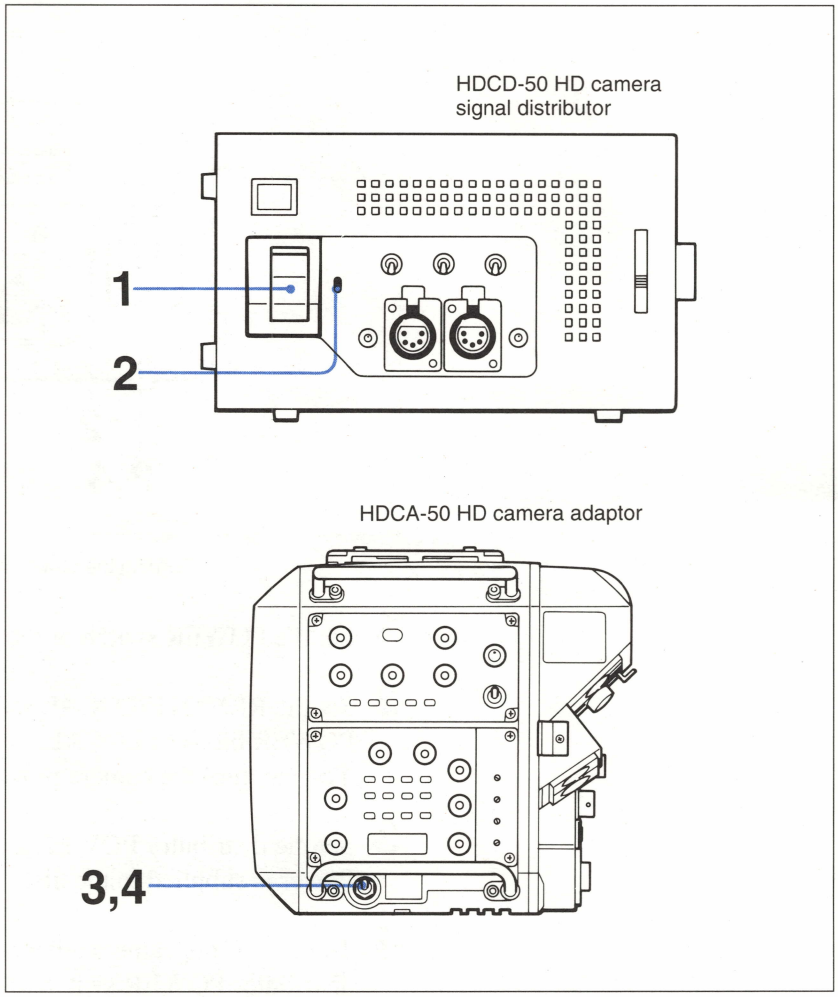
1 Set the POWER switch of the camera adaptor to ON.

2 Set the REMOTE/LOCAL switch of the signal distributor POWER block to LOCAL.
You can turn the camera power on and off from the distributor.

3 Set the distributor POWER switch to ON.
Power is supplied to the distributor and the camera.

4 To turn off the camera adaptor power after shooting, set the distributor POWER switch to OFF.

Turning the camera on and off from the camera adaptor



Turning the power on/off from the adaptor

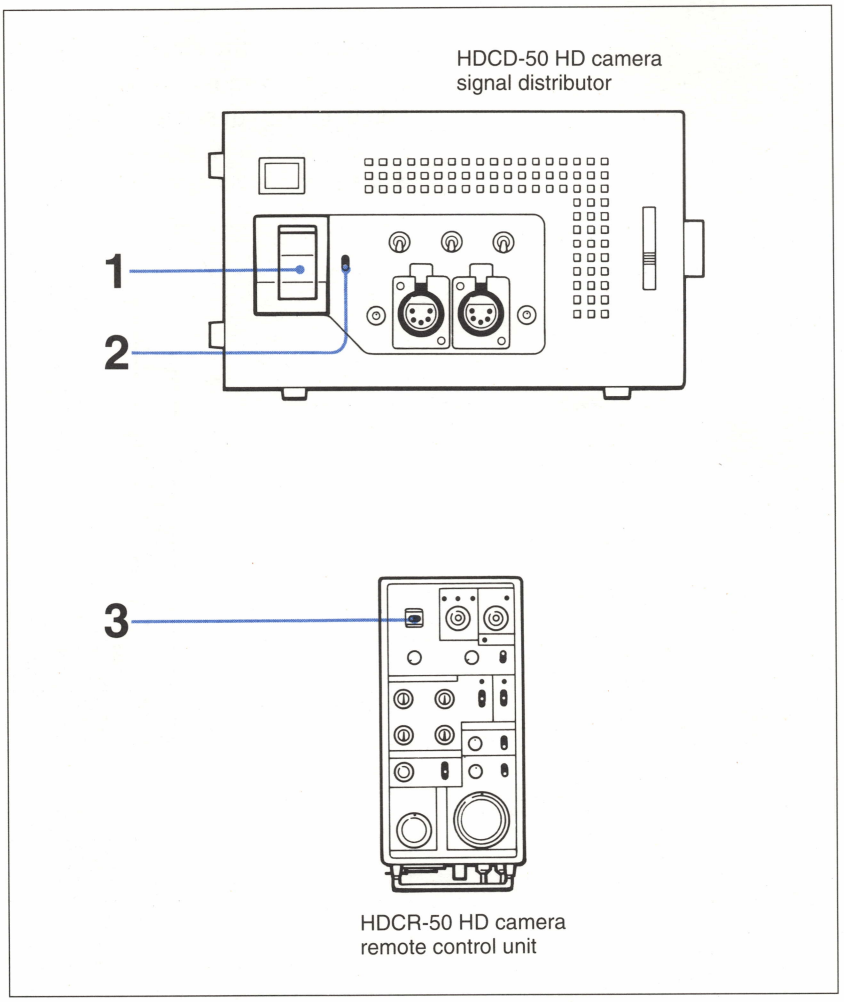
1 Set the distributor POWER switch to ON.

2 Set the REMOTE/LOCAL switch of the signal distributor POWER block to LOCAL.

3 Set the POWER switch of the camera adaptor to ON. Power is supplied to the camera.

4 To turn off the camera power after shooting, set the adaptor POWER switch to OFF.

Turning the camera on and off from the remote control unit



Turning the power on/off from the remote control unit

1 Set the POWER switches of both the adaptor and the distributor to ON.

2 Set the REMOTE/LOCAL switch of the signal distributor POWER block as follows.

REMOTE	When the remote control unit is connected to the distributor.
LOCAL	When the remote control unit is connected to the adaptor.

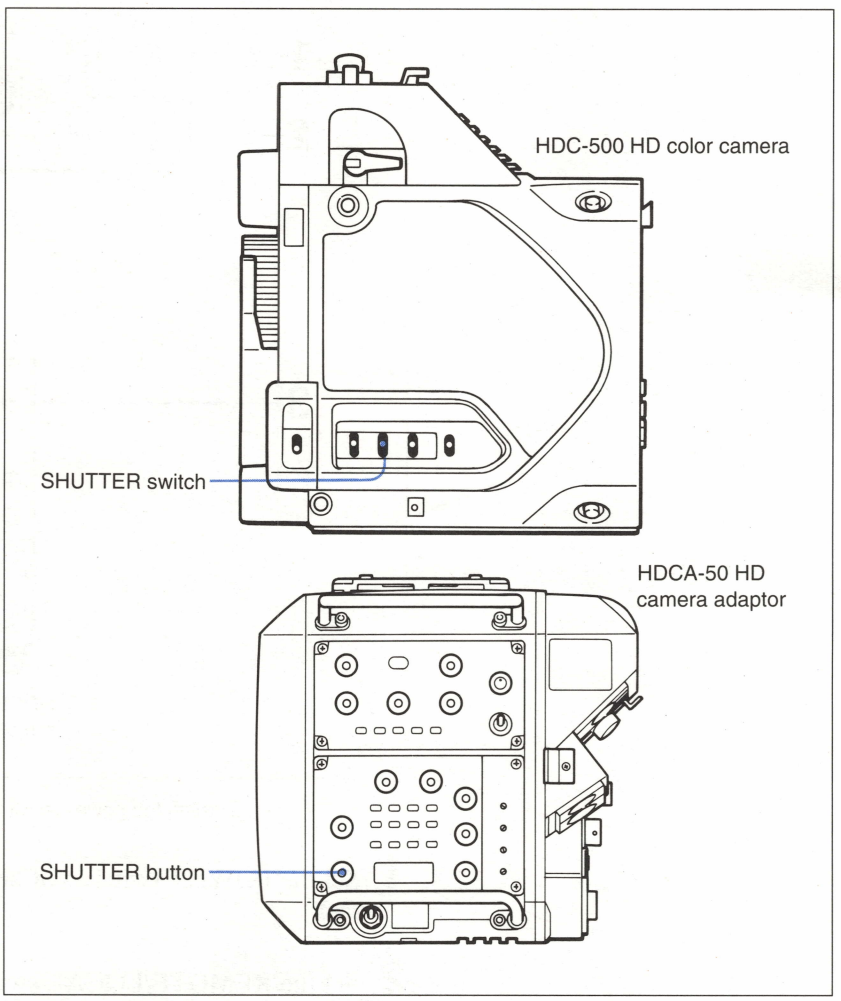
3 Set the CHU POWER ON/OFF switch of the remote control unit to ON.
Power is supplied to the camera.

4 To turn off the camera power after shooting, set the adaptor POWER switch to OFF.

3-1-2 Turning the Electronic Shutter On/Off

You can turn the electronic shutter on and off either from the color camera or from the camera adaptor. The camera setting, however, takes priority over the camera adaptor.

For an explanation of how to set the shutter speed, refer to subsection "3-2-3 Setting the Shutter Speed."



Turning the electronic shutter on/off

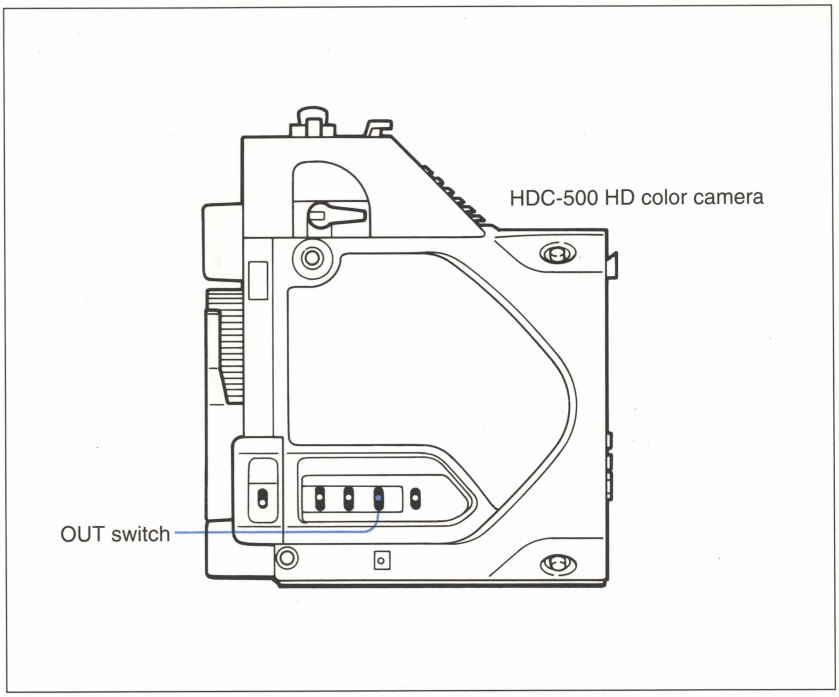
When the SHUTTER switch of the camera or the SHUTTER button of the adaptor is set to ON, the electronic shutter is turned on, and the electronic shutter function is activated. When you do not wish to use the electronic shutter function, set the SHUTTER switch and button to OFF. In this case, the camera setting takes priority.

Note

Even when the SHUTTER switch of the camera is set to OFF, you can change the electronic shutter setting from the connected remote control unit. In this case, the setting of the remote control unit takes priority.

3-1-3 Switching the Camera Output Signal/Color Bar Signal

You can select the video signal output to the viewfinder/video monitor/VTR with the camera's OUT (output signal/DCC[1]) switch.



Switching the camera output signal

BARS DCC OFF	Color bar signals are output. Select this position when: • adjusting the video monitor • recording color bar signals • changing to VF menu mode.
CAM DCC OFF	Video signal being shot by the camera is output. (The DDC circuit is disabled.)
CAM DCC ON	Video signal being shot by the camera is output. (The DDC circuit is enabled.)

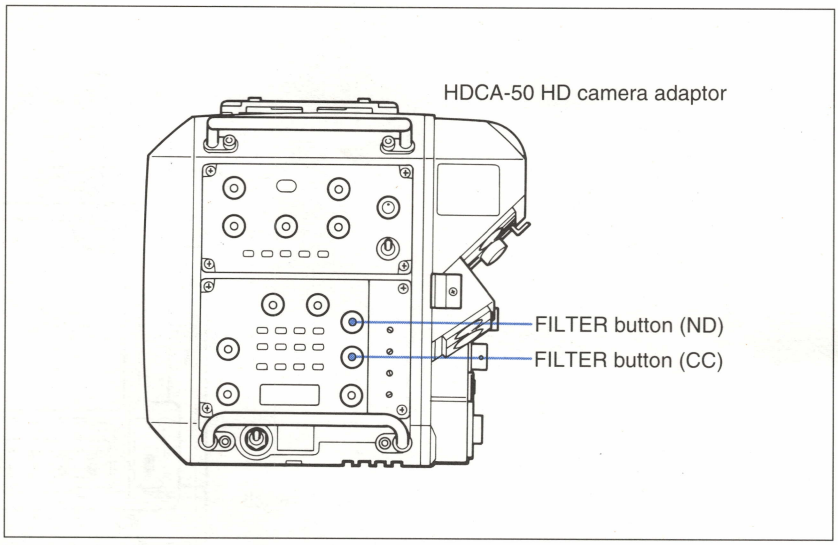
You can also switch the camera video signal/color bar signals/test signals from the HDCR-50 remote control unit.
For details, refer to subsection "5-4-1 Switching the Camera Output Signal."

[1] **DCC:** Dynamic Contrast Control

3-2 Basic Setting Up

This section explains the settings necessary to ensure successful recording: filter, gain, shutter speed, and auto knee. How to call a file is also explained.

3-2-1 Switching the Filter



Switching the filter

You can switch the filter with the FILTER button on the camera adaptor or on the camera. Once the filters have been set, the setting remains valid until changed by the user. To select a filter, press one of the FILTER ND and CC buttons on the camera adaptor. The corresponding lamps light.

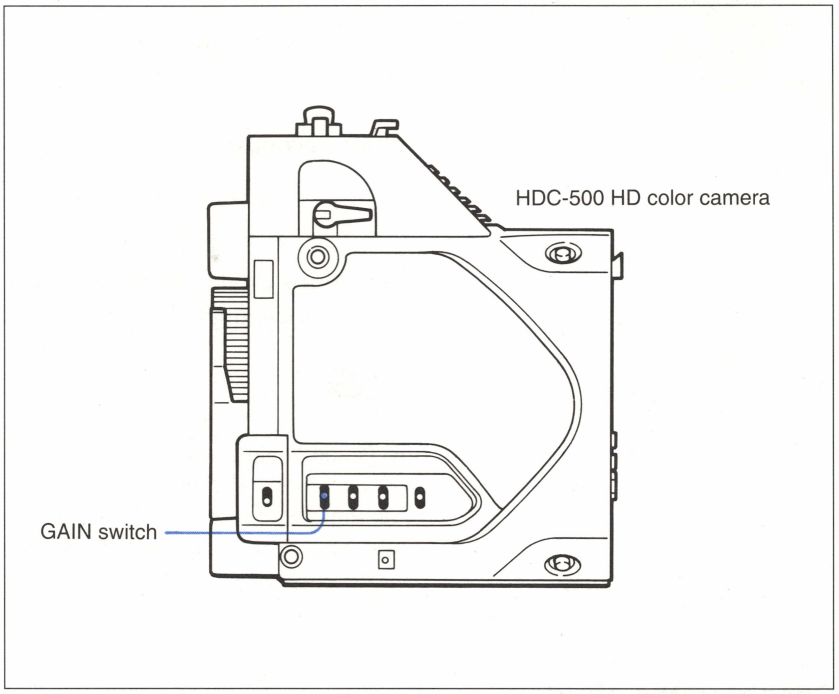
ND setting	Display	Function
1	CLEAR	Completely transparent
2	1/4 ND	ND filter to reduce the light quantity to 1/4
3	1/8 ND	ND filter to reduce the light quantity to 1/8
4	1/16 ND	ND filter to reduce the light quantity to 1/16

CC setting	Display	Application
A	3200 K	Press this button when the color temperature of the lighting is 3200 K.
B	4300 K	Press this button when the color temperature of the lighting is 4300 K.
C	6300 K	Press this button when the color temperature of the lighting is 6300 K.
D	EFFECT	Cross filter for special effect

ND: Neutral Density
CC: Color Compensation

3-2-2 Setting the Gain

When the lighting level is such that the picture on the monitor is too dim, adjust the gain.



Setting the gain

To set the gain, set the camera's GAIN switch to the appropriate position.

0:	Normally, keep the switch set to this position.
6:	Raises the video output level by 6 dB.
12:	Raises the video output level by 12 dB.

The 12dB position of the GAIN switch can be set at 18dB by changing the internal switch setting.
For changing the internal switch setting, refer to the maintenance manual supplied.

You can also set the gain from the HDCR-50 camera remote control unit. When the remote control unit is connected to the camera, the setting made on the camera takes priority.
For details, refer to subsection "5-2-1 Setting the Gain."

3-2-3 Setting the Shutter Speed

Shutter speed range

You can select the shutter speed from one of eight steps, in the order shown below.

(unit: seconds)

→ 1/100 → 1/125 → 1/250 → 1/350 → 1/500 → 1/1000 → 1/2000 → CLS[1)] →

In auto iris mode, the iris opens as the shutter speed becomes faster and the focal depth becomes shallower.

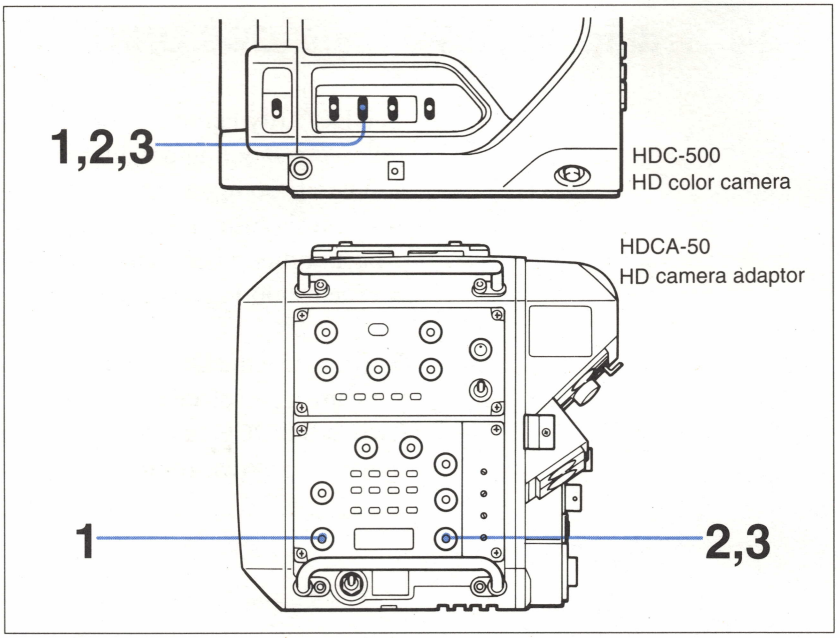
Note

Under artificial lighting, especially fluorescent lamps or mercury lamps, the R, G and B luminance changes in synchronization with the frequency of the power supply (flickering). If you use certain shutter speeds under such lighting conditions, flicker may increase. In 60-Hz areas, color flicker may also occur. In 50-Hz areas, flicker can be reduced by setting the shutter speed to 1/100 second.

Changing the shutter speed

You can set the shutter speed from the camera, camera adaptor, or remote control unit. The setting, however, takes priority in the order of the remote control unit, the camera, and the camera adaptor.
For details of how to set the shutter speed from the HDCR-50 remote control unit, refer to subsection "5-2-2 Setting the Shutter Speed."

[1)] **CLS:** Clear Scan



Changing the shutter speed

1 Set the SHUTTER switch of the camera or the SHUTTER button of the camera adaptor to ON.
The currently set shutter speed is displayed on the SHUTTER speed display window. When you select CLS, however, only "CLS" is displayed on the window. To check the shutter speed, use the menu.

2 Set the camera's SHUTTER switch to SEL or press the adaptor SEL button as many times required to select the desired shutter speed.

3 To set the fine shutter speed to between 1/60.4 and 1/350 seconds, select CLS (Clear Scan) and then set the fine shutter speed from the menu. The most recently selected shutter speed is held, even if the power is turned off. To use a memorized shutter speed, select CLS.

For an explanation of how to select the shutter speed from the menu, refer to subsection "3-5-2 Menu Operation."

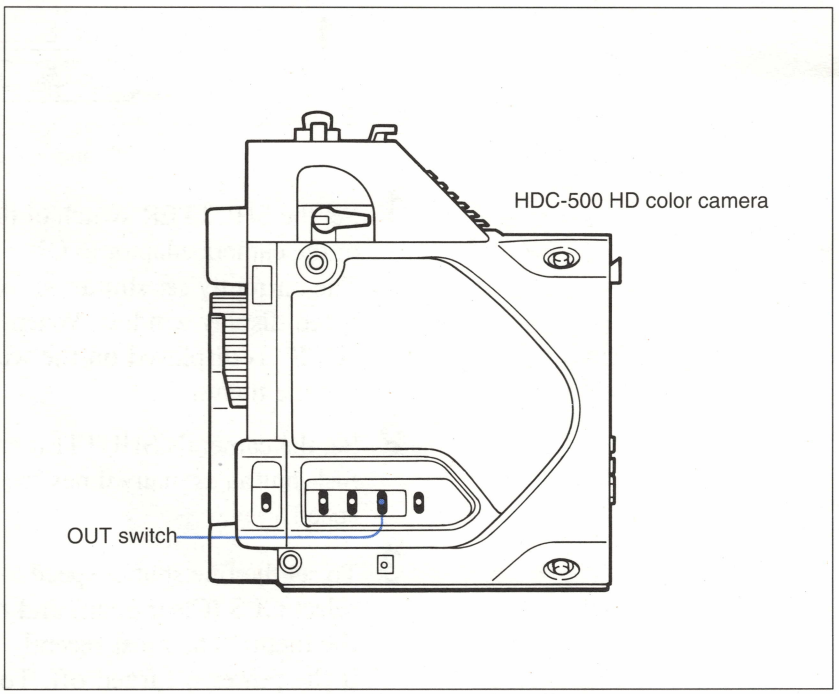
Even when the camera's SHUTTER switch is set to OFF, you can set the shutter speed from the adaptor. By pressing the SEL button, the currently set shutter speed blinks for 5 seconds in the SHUTTER speed display window. Press the SEL button as many times as necessary until the desired shutter speed appears in the window. When the SHUTTER switch is set to OFF, however, you cannot use the electronic shutter function. To activate the electronic shutter function, set the SHUTTER switch to ON.

3-2-4 Setting the AUTO Knee (DCC ON/OFF)

The DCC (dynamic contrast control) function is effective under the following shooting conditions.

- When shooting a subject in the shade on a clear day
- When shooting a subject indoors (in a car or room), with a background visible through the window
- When shooting a scene having very strong contrast.

You can use the DCC function when the video signal being shot by the camera is selected.
Switch the DCC function on and off with the OUT (output signal/dynamic contrast control) switch on the camera.



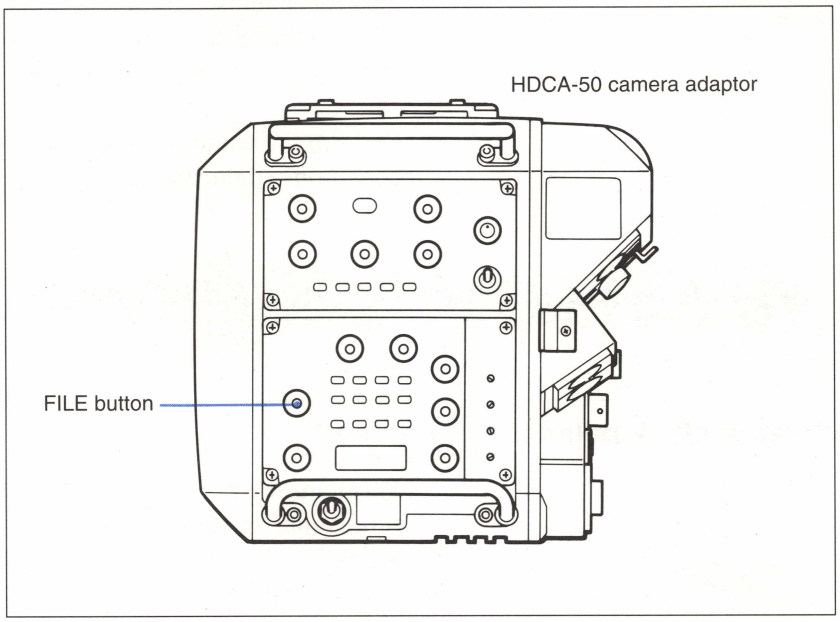
Setting the AUTO knee

BARS DCC OFF	The DCC circuit is disabled. Select this position when: • adjusting the video monitor • recording color bar signals • changing to VF menu mode.
CAM DCC OFF	The DCC circuit is disabled.
CAM DCC ON	The DCC circuit is enabled.

You can also adjust the knee point automatically and manually from the HDCR-50 remote control unit.
For details, refer to subsection "5-1-6 Knee Point Adjustment."

3-2-5 Calling the File

You can retrieve the scene file, previously stored with the remote control unit, from the adaptor.



Calling the file

Every time you press the adaptor's FILE button, scene files are selected in the following order.
OFF → 1 → 2 → 3 → 4 → OFF
Registration of a scene file is performed from the HDCR-50 remote control unit or from the HDCR-350 remote control panel.
For an explanation of how to store a scene file, refer to section "5-3 File Operation" of this manual or the maintenance manual supplied with the HDCR-350.

3-3 Basic Adjustment

This section explains how to adjust the black balance and white balance.

Perform the black balance adjustment in the following cases.
- When using the camera system for the first time, or after the system has been unused for a long time.
- When the temperature changes suddenly.

Usually, the settings will be held even when the power is turned off.

Perform the white balance adjustment whenever the lighting conditions (light source) change.

3-3-1 Automatic Black Balance Adjustment

What is black balance adjustment?

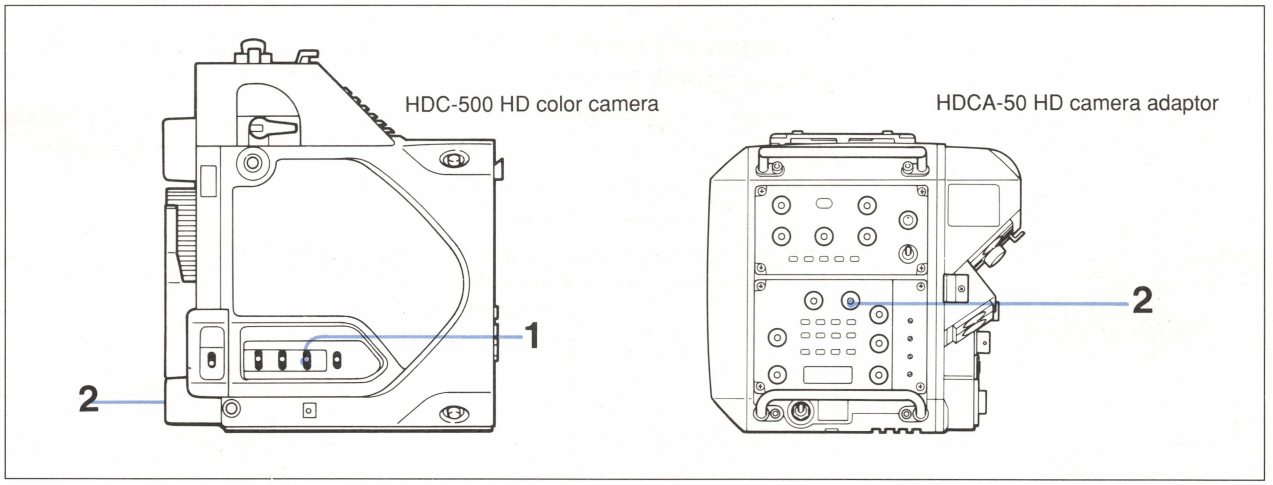
This adjustment is carried out so that black subjects appear natural. If the relative black level of each of the R, G, and B channels is not the same, black objects, or those that are mostly black, become reddish or bluish.

Automatic black balance adjustment

To adjust the general black balance (3200K), follow the procedure below.

You can adjust the black balance automatically from the camera, the camera adaptor or remote control unit. Manual adjustment of the black balance can be performed from the remote control unit.

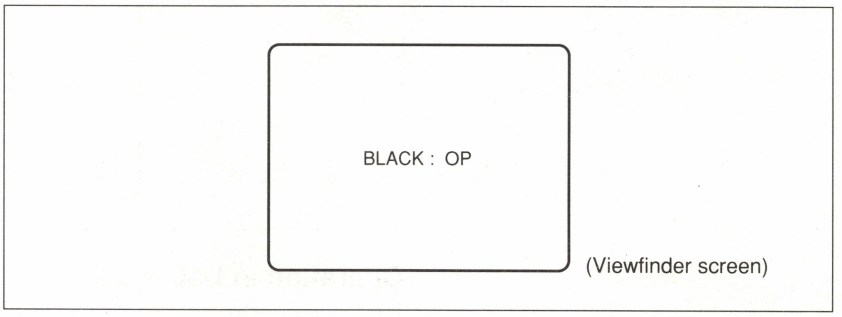
For details of making an adjustment from the HDCR-50 remote control unit, refer to subsection "5-1-1 Automatic/Manual Black Balance Adjustment."



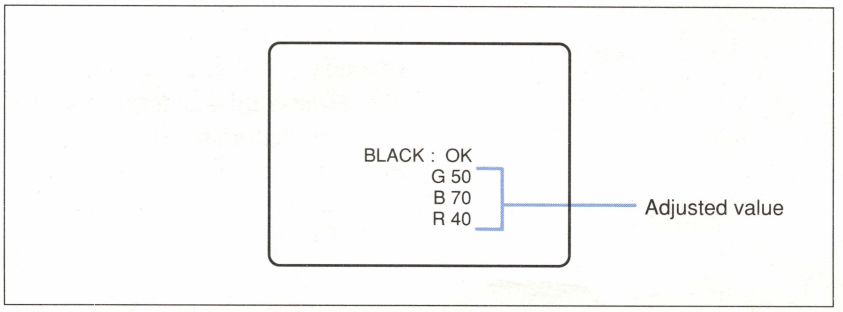
Automatic black balance adjustment

1 Set the OUT (output signal/dynamic contrast control) switch of the camera to CAM.

2 Press the adaptor's AUTO BLACK button or set the camera's AUTO W/B BAL switch to BLK.



The general black balance is adjusted automatically.

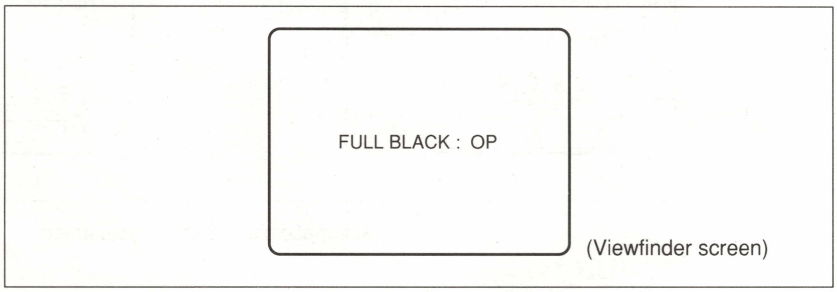


Black balance adjustment is completed within a few seconds and the settings are automatically stored to memory. If any of the following messages are displayed in the viewfinder, automatic adjustment fails. In this case, perform manual adjustment.

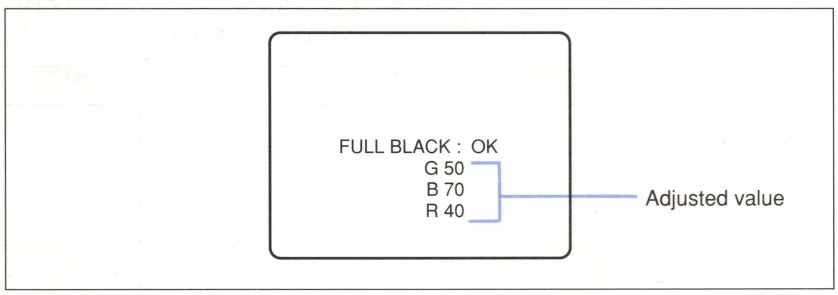
Error message	Possible causes
OUT OF RANGE	The level is beyond the adjustable range.
TIME LIMIT	Focusing cannot be done within the time available.

To adjust the black balance in D56 mode, together with the general black balance

Perform the following operation in step 2.
Hold down the adaptor's AUTO BLACK button for about 2 seconds, or hold the camera head's AUTO W/B BAL switch in the BLK position for about 2 seconds.
The following screen appears in the viewfinder.



Once the general black balance adjustment has been completed, the black balance in D56 mode is automatically adjusted.



Operation in D56 mode

By pressing the adaptor's AUTO BLACK button or setting the camera's AUTO W/B BAL switch to BLK, the black balance is automatically adjusted in D56 mode.
By holding down the adaptor's AUTO BLACK button for about 2 seconds or holding the camera's AUTO W/B BAL switch to BLK for about 2 seconds, general black balance and the black balance in D56 mode are automatically performed.
Select D56 mode from the menu.
For details of the menu operation, see "3-5-1 Menu Set-Up Item" and "3-5-2 Menu Operation".

3-3-2 Automatic White Balance Adjustment

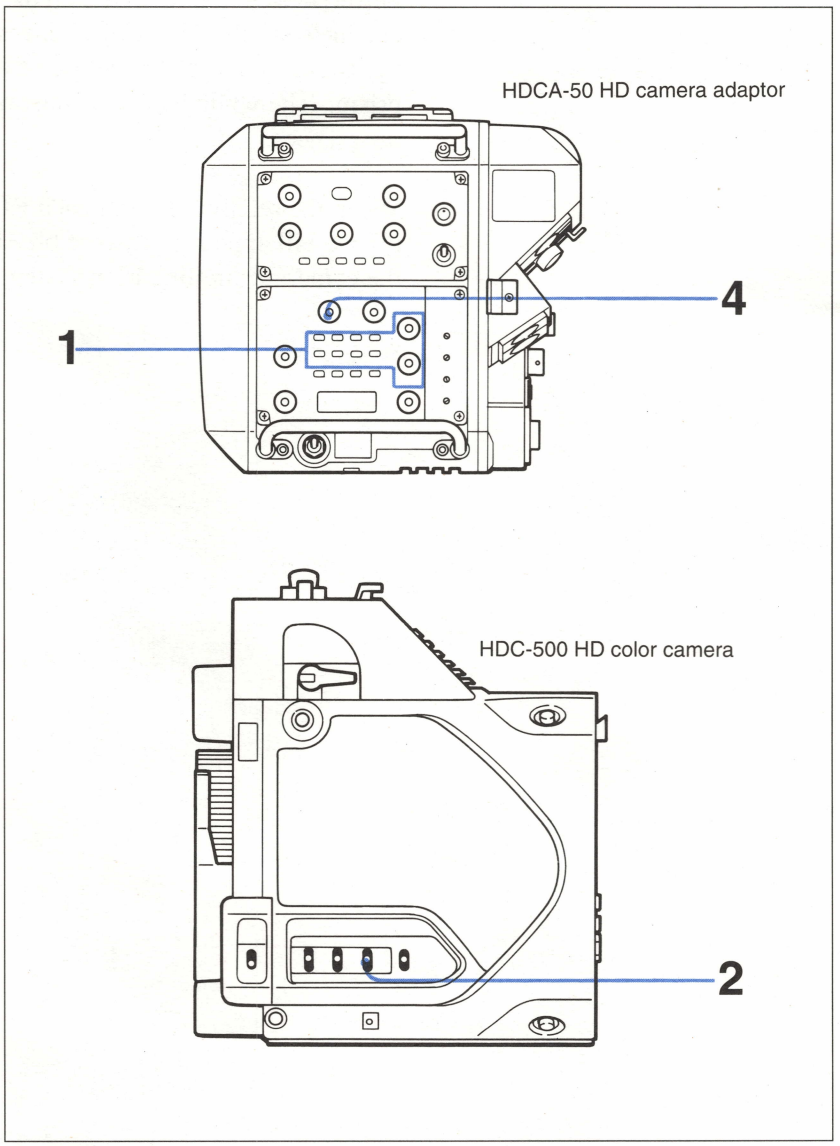
What is white balance adjustment?

This adjustment is carried out so that white subjects appear natural. Differences in the relative output level of each of the R, G, and B channels are caused by differences in the color temperature of the light source, spectral response of the charge coupled device (CCD) or prism. The white balance adjustment compensates for these differences.

When the relative level of each RGB channel is different, a white object will appear reddish or bluish. This may be because the gain of the camera's amplification system has not been adjusted.

Automatic white balance adjustment

You can adjust the white balance automatically from the camera, the camera adaptor or remote control unit. Manual adjustment of the white balance can be performed from the remote control unit.
For details of making an adjustment from the HDCR-50 remote control unit, refer to subsection "5-1-2 Automatic/Manual White Balance Adjustment."



Automatic white balance adjustment

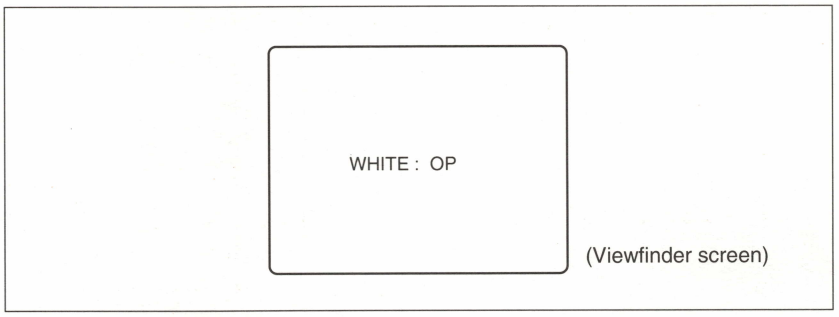
1 Press the FILTER button of the camera or the camera adaptor as many times as necessary to select the filter appropriate to the color temperature of the light source.

A	B	C	D
3200K	4300K	6300K	EFFECT (for special effects)

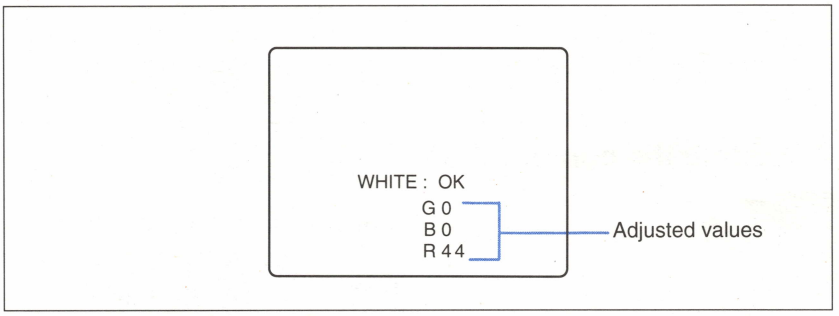
2 Set the OUT (output signal/dynamic contrast control) switch of the camera to CAM.

3 Aim the camera at a reference white subject or gray scale.

4 Press the adaptor's AUTO WHITE button or set the camera's AUTO W/B BAL switch to WHT.



The white balance is adjusted automatically.

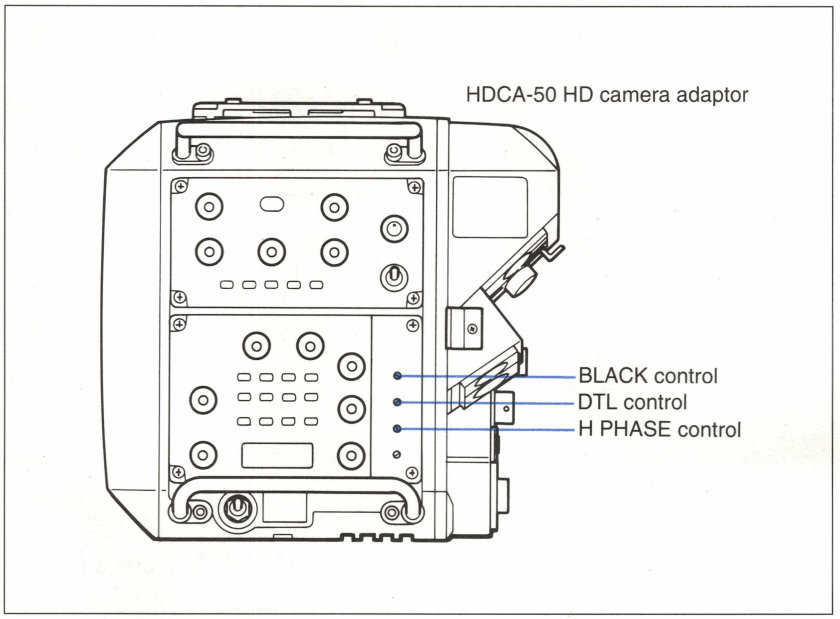


The white balance adjustment is completed within a few seconds and the setting is automatically stored to memory. If any of the following messages are displayed in the viewfinder, automatic adjustment fails. In this case, perform manual adjustment.

Error message	Possible causes
OUT OF RANGE	The level is beyond the adjustable range.
TIME LIMIT	Focusing cannot be done within the time available.
LOW LEVEL	The signal level is too low.

3-4 Auxiliary Adjustment

This section explains how to adjust auxiliary items: contour, horizontal phase, and master black.



Adjustment controls

Adjusting the contour (DTL)

You can adjust the amount of contour enhancement from the camera adaptor. Using the internal volume control of the adaptor, the horizontal balance, vertical balance, and crispning level (noise component level of the detail signal) can be adjusted.
For details of making an adjustment with the internal controls, refer to the maintenance manual supplied with the stand-alone system.

1 Prepare for adjustment.

Subject	Object for which contour adjustment is to be performed
Light source (light condition)	Use the same light source as that used for the actual shooting.
Filter	Set according to the color temperature of the light source.
Focus	Set the focus correctly.
Measuring instruments	Video monitor

2 Adjust the contour enhancement with the DTL (detail gain) control of the camera adaptor.

Adjusting the horizontal phase (H PHASE)

You can adjust the horizontal phase for external synchronization either from the camera adaptor or from the camera signal distributor.

Adjusting from the camera adaptor

Use the H PHASE control to adjust the horizontal phase.
You can shift the adjustment range of the H PHASE control with the internal volume control.
For details of how to set the internal volume control, refer to the maintenance manual supplied with the stand-alone system.

Adjusting from the camera signal distributor

Use the H PHASE switch and control on the sub-panel.

1 Make sure that the ACTIVE lamp is lit.
2 Set the H PHASE switch to CTL.
3 Adjust the horizontal phase with the H PHASE control.
4 Set the H PHASE switch to LOCK.

Adjusting the master black

The master black adjustment, corresponding to the contrast adjustment for a video monitor, is required mainly in the following cases.

- When adjusting the black gradation
- When the reference black level is required for the cameras constituting a multi-camera system.

You can adjust the master black level with the BLACK control of the camera adaptor or the MASTER BLACK dial of the remote control unit. The black level of each R, G, and B channel changes simultaneously.

3-5 Menu Operation

3-5-1 Menu Set-Up Item

You can set and display the following six items from the system menu.

- **VF IND (viewfinder indication)**
Switches the display mode of the viewfinder screen. To erase a display, select the same mode again.

- **VF MARKER (viewfinder marker)**
Selects the picture frame displayed on the viewfinder screen. To erase the frame, select the same mode again.

- **CLS (clear search for continuous increment and decrement)**
Sets the fine shutter speed.

- **READOUT SEL**
Switches the CCD readout mode.

- **ZEBRA**
Selects the zebra pattern display mode.

- **D56**
Electronically selects the 5600K black balance.

Menu	Setup/display item	Contents
VF IND	FILTER	Displays the number of the selected filter.
	TAPE	Displays the remaining amount of the tape. (Only when a VTR is connected)
	VOLTAGE	Displays the input voltage of an external DC power source (ex. battery).
	SHUTTER	Displays the shutter speed. To set the shutter speed, select this mode.
	EVS	Displays the Super EVS mode number. To set the number, select the READOUT SEL menu.
	GAIN	Displays the gain. To set the gain, select this mode.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
VF MARKER	CENTER MARKER	Displays the center marker on the viewfinder screen.
	4:3 FRAME	Displays a picture frame having a 4:3 aspect ratio.
	SAFETY ZONE 1	Displays the safety zone (effective screen) of the camera for shooting. (9%)
	SAFETY ZONE 2	Displays the safety zone (effective screen) of the camera for shooting. (92.5%)
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.

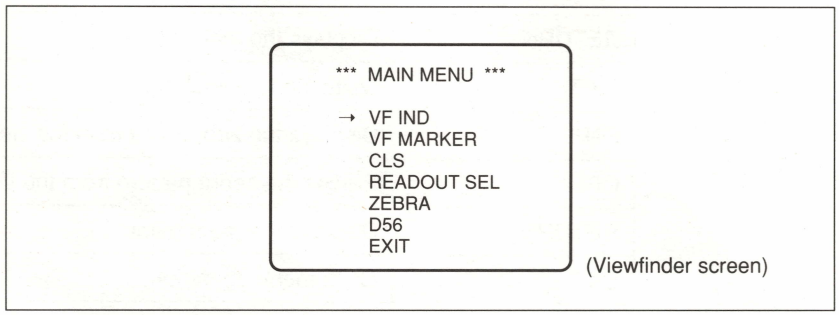
Menu	Setup/display item	Contents
CLS	FASTER(UP)	Sets a faster shutter speed.
	SLOWER (DOWN)	Sets a slower shutter speed.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
READOUT SEL	EVS	Sets the number of the Super EVS (enhanced vertical definition system) mode.
	FIELD	Selects the field mode.
	FRAME	Selects the frame mode.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
ZEBRA	ON	Displays the zebra pattern in the viewfinder.
	OFF	Erases the zebra pattern from the viewfinder.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
D56	ON	Obtains the 5600K electronic black balance.
	OFF	Returns to the 3200K general black balance.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.

3-5-2 Menu Operation

Perform the following to set menu items from the camera.

1 Set the OUT (output signal/dynamic contrast control) switch to BARS DCC ON.
Color bars are displayed on the viewfinder. (Color-bar mode)

2 Set the AUTO W/B BAL switch to WHT.
The main menu is displayed in the viewfinder. (Menu mode)



(Viewfinder screen)

3 Move the cursor to the desired item by turning the AUTO W/B BAL switch toward:
WHT : ↑ (moves up)
BLK : ↓ (moves down)

4 Press the VTR STR button to select the desired item.
The selected sub-menu appears in the viewfinder.

5 Move the cursor to the desired item by turning the AUTO W/B BAL switch toward:
WHT : ↑ (moves up)
BLK : ↓ (moves down)

6 Press the VTR STR button to execute the selected item.
The executed item is displayed in the viewfinder.

7 To continue, select RETURN to display the main menu. Repeat steps 3 to 6 to set other items.
To quit, select EXIT.

Chapter 4 Recording

This chapter explains the basic operating procedure involved in shooting, and various auxiliary operations.

4-1 Basic Operating Procedure 4-2
4-2 Operations Performed from the Camera (HDCA-50) 4-3
4-2-1 Kinds of Operation 4-3
4-2-2 Auxiliary Operation 4-4
4-3 Operations Performed from the Remote Control Unit 4-6
4-4 INCOM (Intercom) Operation (HDC-500, HDCA-50, HDCD-50, HDCR-50) 4-7
4-4-1 Example INCOM (Intercom) Connection 4-7
4-4-2 Example INCOM (Intercom) Lines and Switch Setting 4-8
4-4-3 Turning the INCOM (Intercom) Microphone On/Off and Adjusting the Level 4-10
4-5 Viewfinder Display and Selecting the Input Signal (HDC-500 and HDCA-50) 4-11
4-5-1 Viewfinder Display 4-11
4-5-2 Selecting the Input Signal 4-12

4-1 Basic Operating Procedure

This section explains the basic operating procedure involved in shooting.

Refer to the pages indicated in ( ).

1 Turn the power of the system on. (page 3-2)

2 Call the scene file, as required. (page 3-13)

3 Perform the basic settings according to your shooting condition as required. (pages 3-8 to 3-13)

4 Adjust the black and white balance as required. (only when the remote control unit is connected, pages 3-14 to 3-19)

5 Store the data to the scene file as required. (only when the remote control unit is connected, page 5-11)

6 Start shooting.

7 End shooting.

8 To shoot another scene, repeat steps 2 to 7.

4-2 Operations Performed from the Camera

4-2-1 Kinds of Operation

Camera engineers perform mainly camera work and the following works.

- Camera work (Angle setting, etc.)
- Adjustment operation (Lens operation such as iris/focus adjustment, etc.)
- Auxiliary operations (Urgent filter change, etc.)

This section explains the auxiliary operations.
For details of other operations, refer to the operation manual for each unit.

Camera work

- Frame/angle setting
- Panning/tilting

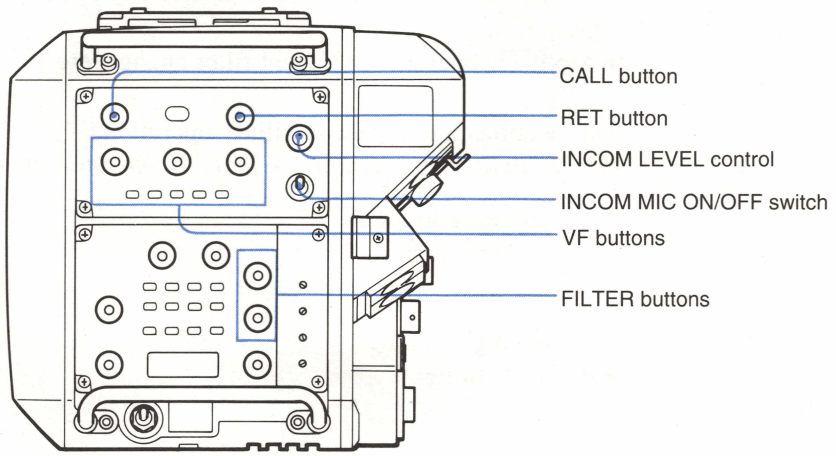
Adjustments

- Iris adjustment
- Focus adjustment
- Zooming

Auxiliary operations

- Filter change
- Center marker/frame display
- Monitoring R/G/B/Y signals or return video
- INCOM (Intercom) operation

4-2-2 Auxiliary Operation



HDCA-50 HD camera adaptor

Operation buttons, control, and switch

Monitoring the return video

RET (return) button

To monitor the return video, press the RET button.
The picture of the return video signal appears in the viewfinder while this button is held down. The Y signal is output when the return video signal has already been output.

INCOM (Intercom) operation

CALL button

The CALL lamp on the HDCR-50 and the tally lamp on the HDCR-350 light while this button is held down. If you press this button while the HDCR-350's tally lamp is lit, however, the lamp goes off.

INCOM MIC (microphone) ON/OFF switch

ON: Turns on the microphone of the headset for INCOM.
OFF: Turns off the microphone of the headset for INCOM.

INCOM LEVEL control

Adjusts the level of the received INCOM audio.

Changing a filter

FILTER buttons

Select the desired filter using corresponding filter button.

ND: Changes the ND filter in the order of 1, 2, 3, 4 and 1... whenever you press this button.

1	CLEAR	Completely transparent
2	1/4 ND	Reduces the light quantity to 1/4.
3	1/8 ND	Reduces the light quantity to 1/8.
4	1/16 ND	Reduces the light quantity to 1/16.

CC: Changes the CC filter in the order of A, B, C, D and A.. whenever you press this button.

A	3200 K	Use this filter when the color temperature of the lighting is 3200 K.
B	4300 K	Use this filter when the color temperature of the lighting is 4300 K.
C	6300 K	Use this filter when the color temperature of the lighting is 6300 K.
D	EFFECT	Cross filter for special effect

Changing viewfinder indication

VF (viewfinder) buttons

Selects the viewfinder indication.

FRAME: Displays the HD safety zone and etc. in the viewfinder. Press this button again. The safety zone disappears.

CENTER: Displays the center marker on the viewfinder screen. Press this button again. The center marker disappears.

SELECT: The displayed signal changes in the order of Y, G, B, R, RET, Y....whenever you press this button.

Y	Y signal	**R**	R component
G	G component	**RET**	Return video
B	B component		

4-3 Operations Performed from the Remote Control Unit

Video engineers perform adjustment of the picture tone and video tone for all cameras constituting a multi-camera system, and control the system to ensure high-quality pictures from the remote control unit.

This section explains the outline of operations.
For other operations, refer to "Chapter 5 Remote Control Operation."

Main operation

- Starting the system (pages 3-2 to 3-7)
- Calling/modifying the scene file (page 5-10)

Operation during broadcasting/recording

- Adjustment of white balance and black balance (pages 5-2 to 5-5)
- Adjustment of master black (page 5-6)
- Adjustment of iris (page 5-6)

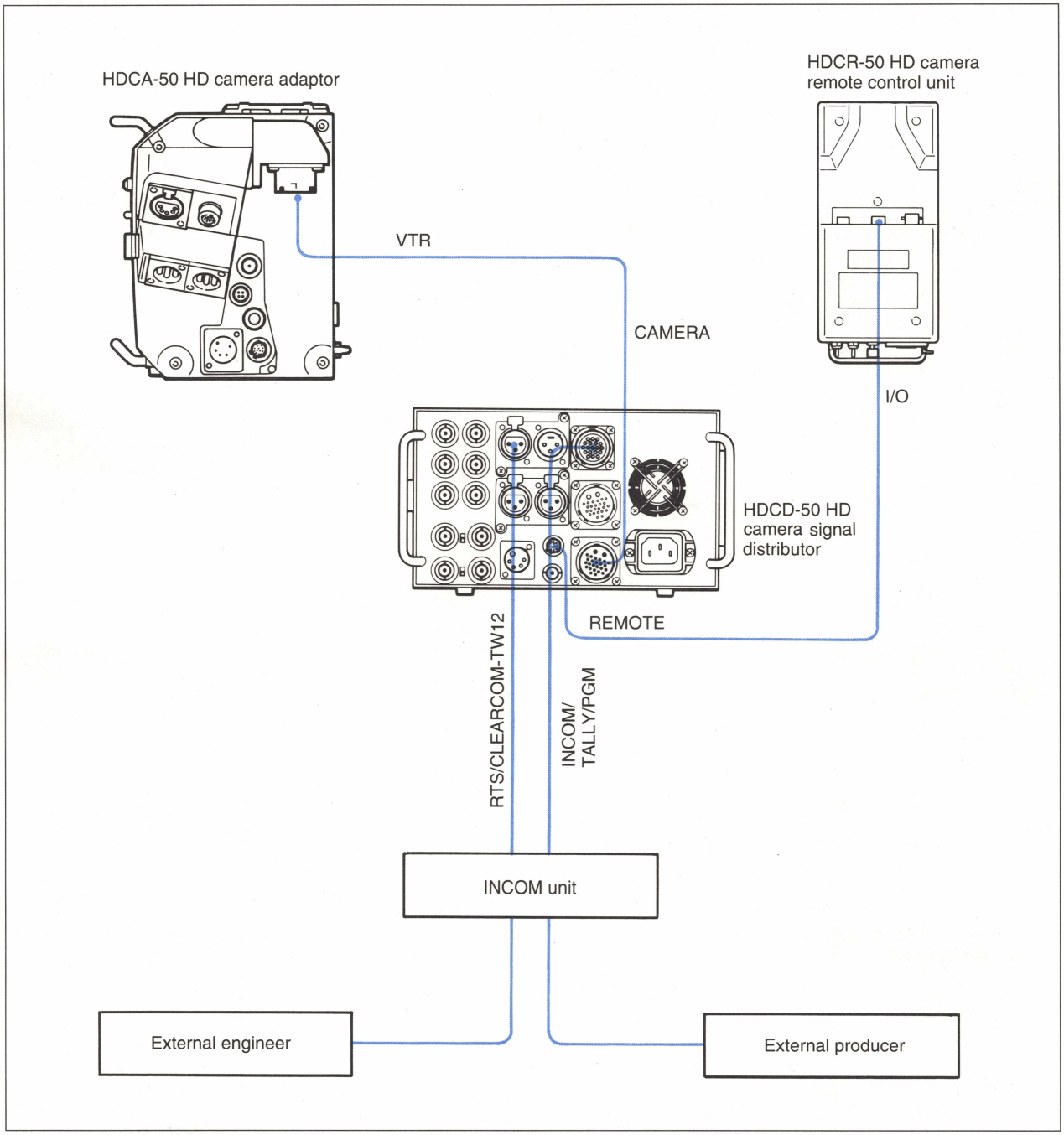
Auxiliary operation

- INCOM (Intercom) operation (page 4-7)
- Turning on/off the intercom microphone and switching the intercom line (pages 4-10 and 5-14)

4-4 INCOM (Intercom) Operation

"INCOM" or "Intercom", the abbreviation for intercommunication, is a system that allows you to communicate with others nearby via the INCOM lines. This section provides examples of INCOM connections and lines, and explains how to set the switches.

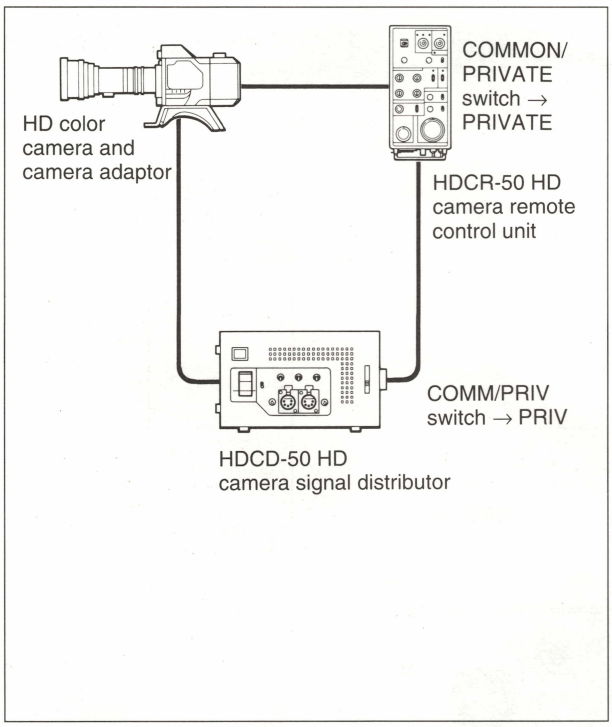
4-4-1 Example INCOM (Intercom) Connection



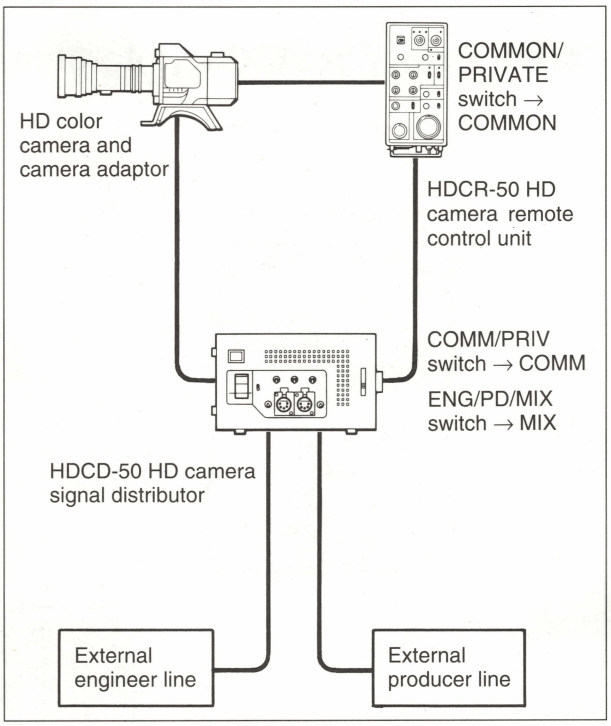
Example INCOM connection

4-4-2 Example INCOM (Intercom) Lines and Switch Setting

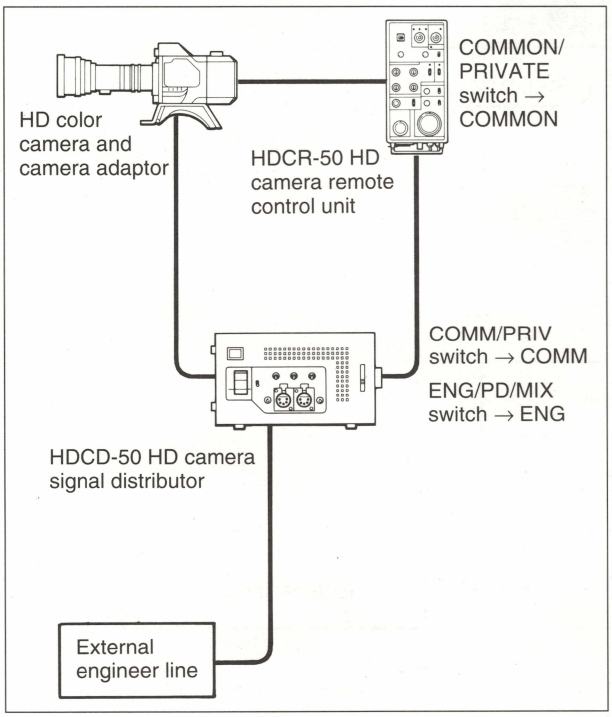
Example 1



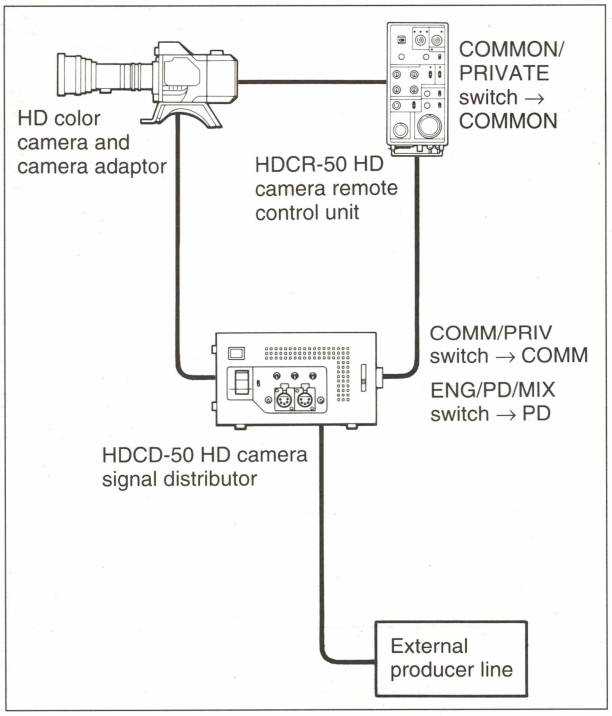
Example 2



Example 3



Example 4



Example INCOM lines and switch setting

COMM/PRIV switch (HDCD-50)

COMM	Connects external INCOM lines.
PRIV	Disconnects external INCOM lines.

ENG/PD/MIX switch (HDCD-50)

ENG	Selects the engineer line only.
PD	Selects the producer line only.
MIX	Selects both the engineer and producer lines.

COMMON/PRIVATE switch (HDCR-50)

COMMON	Connects external INCOM lines.
PRIVATE	Disconnects external INCOM lines.

Abbreviations
COMM: common
PRIV: private
ENG: engineer
PD: producer

4-4-3 Turning the INCOM (Intercom) Microphone On/Off and Adjusting the Level

Operation from the camera adaptor

Use the INCOM MIC ON/OFF switch to turn the microphone on and off.

ON	Turns the INCOM headset microphone on.
OFF	Turns the INCOM headset microphone off.

Use the INCOM LEVEL control to adjust the level of the received INCOM audio.

Operation from the camera signal distributor

Use the CALL and MIC ON/OFF switch to turn the microphone on and off.

MIC ON	Turns the INCOM headset microphone on.
MIC OFF	Turns the INCOM headset microphone off.

Use the LEVEL control to adjust the level of the received INCOM audio.

Operation from the camera remote control unit

Use the CALL and MIC ON/OFF switch to turn the microphone on and off.

MIC ON	Turns the INCOM headset microphone on.
MIC OFF	Turns the INCOM headset microphone off.

Use the LEVEL control to adjust the level of the input INCOM audio.

4-5 Viewfinder Display and Selecting the Input Signal

4-5-1 Viewfinder Display

Selecting the display data

Use the camera menu operation to switch the data displayed on the viewfinder screen.

1 Set the OUT (output signal/dynamic contrast control) switch to BARS DCC ON.
Color bars are displayed on the viewfinder screen.
(Color-bar mode)

2 Turn the AUTO W/B BAL switch toward WHT.
The main menu is displayed on the viewfinder screen.
(Menu mode)

3 Move the cursor to "VF IND" by turning the AUTO W/B BAL switch toward:
WHT : ↑ (moves up)
BLK : ↓ (moves down)

4 Press the VTR STR button to select "VF IND."
The VF IND (viewfinder indication) sub-menu appears on the viewfinder screen.

TAPE	Displays the remaining amount of tape. (Only when a VTR is connected)
VOLTAGE	Displays the input voltage of an external DC power source (ex. battery).
SHUTTER	Displays the shutter speed.
EVS	Displays the Super EVS mode number.
GAIN	Displays the gain value.
RETURN	Returns to the previous menu.
EXIT	Returns to the main menu.

5 Select the desired item by turning the AUTO W/B BAL switch toward:
WHT : ↑ (moves up)
BLK : ↓ (moves down)

Selecting the picture frame display

Use the camera adaptor's VF buttons to select the line or signal displayed on the viewfinder screen.

FRAME	Displays the HD safety zone. To erase the display, press this button again.
CENTER	Displays the center marker of the viewfinder screen. To erase the display, press this button again.

You can also switch the display of center marker, 4:3 picture frame, and HD safety zone with the VF MARKER sub-menu of the menu operation.
For the details, refer to the subsection "3-5-2 Menu Operation."

4-5-2 Selecting the Input Signal

Use the SELECT button in the VF block of the camera adaptor to select the signal displayed on the viewfinder screen.
Whenever you press SELECT, the displayed signal changes in the order of Y, G, B, R, RET, Y . . . The corresponding lamp lights.

Y	Y signal
G	G component
B	B component
R	R component
RET	Return video

Chapter 5
Operation of HDCR-50 Remote Control Unit

This chapter explains how to operate the HDCR-50 remote control unit.

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5-1 Adjustment

5-1-1 Automatic/Manual Black Balance Adjustment

This subsection explains how to adjust the black balance using the following two parameters.

- BLUE BLACK
- RED BLACK

What is black balance adjustment?

This adjustment is carried out to such that the color of a black subject appears natural.
If the black level of each of the R, G, and B channels is not the same, a black object, or one with a largely black part becomes reddish or bluish.

Adjustment methods and purpose

Carry out the black balance adjustment in the following cases.

- When you use the camera for the first time
- When the temperature changes suddenly
- When you do not use the camera for a long period

The following two adjustment methods are available.

- **Automatic adjustment**

Usually use this method.

- **Manual adjustment**

Use this method when you want to adjust the level as you desire.
It is recommended that you carry out the adjustment at rehearsal and store the adjusted value to a file. You can then call up the same conditions at the actual shooting.

– To reset an automatically adjusted value to a manually set reference value
– To carry out adjustment according to the environment or lighting conditions of the studio or shooting location.
– To add coloring for special effects
You can deliberately set the black balance adjustment off with the intention of adding special effects such that the object will become blackish, reddish or bluish.
Store the adjusted value to a scene file.
– To make adjustment during recording or broadcasting
If automatic adjustment is carried out during recording or broadcasting, the iris is closed automatically. Thus, when the black balance is not adjusted during recording or broadcasting, correct manually with the adjustment control.

Automatic adjustment

1 Set the OUT (output signal/dynamic contrast control) switch of the camera to CAM.

2 Set the WHITE/BLACK switch to BLACK.
The black balance is automatically adjusted to the optimum value.

Manual adjustment

1 Prepare for adjustment.

- **When adjusting the black balance**

Iris	Close completely.
Master gain	Set the master gain according to the actual shooting conditions.
Measuring instrument	Waveform monitor

- **When coloring**

Measuring instrument	Video monitor

2 Make adjustments with the BLACK dials.

5-1-2 Automatic/Manual White Balance Adjustment

This subsection explains how to adjust the white balance using the following two parameters.

- BLUE WHITE
- RED WHITE

What is white balance?

White balance is the adjustment necessary to reproduce a picture in its natural colors. Differences in the relative output level of each channel are caused by differences in the color temperature of the light source, spectral response of the CCD and PRISM.

When the relative level of each RGB channel is different, a white subject will not be reproduced in white. Instead, a white subject will appear reddish or bluish. This may be because the gain of the camera's amplification system has not been adjusted.

Adjustment methods and purpose

Adjust the white balance under the same lighting conditions (the same light source) as the actual shooting. Readjust the white balance whenever the lighting condition (light source) changes.

The following two adjustment methods are available.

- **Automatic adjustment**

Usually use this method.

- **Manual adjustment**

Use this method when you want to set the level as you desire. It is recommended that you can carry out the adjustment at rehearsal and store the adjusted value to a file. You can then call up the same conditions at the actual shooting.

– To carry out adjustment according to the shooting environment and lighting condition at a studio or shooting location

– To add coloring for special effects

You can deliberately set the white adjustment off with the intention of adding special effects. A white object can be made to appear blackish, reddish or bluish. Or, the skin tones can be made warm or cool. You can obtain an effect approximating to sunset, should you wish to shoot a sunset scene during the day.

Store the set values to the scene file.

– To make adjustment during recording or broadcasting

When the white balance is not adjusted during recording or broadcasting, correct it manually with the adjustment control.

Automatic adjustment

1 Set the GAIN and OUT (output signal/dynamic contrast control) switch of the camera as follows.
GAIN: Random position
OUT : CAM

2 Set the WHITE/BLACK switch to WHITE.
The white balance is automatically adjusted to the optimum value.

Manual adjustment

1 Prepare for adjustment.

- **When adjusting the white balance**

Subject	Reference white subject (or gray scale)
Light source (light condition)	Use the same light source as that for the actual shooting.
Filter	Set according to the color temperature of the light source.
Master gain	Set the master gain according to your actual shooting conditions.
Measuring instrument	Waveform monitor

- **When coloring**

Measuring instrument	Video monitor

2 Make the adjustment with the WHITE dials.

5-1-3 Master Black Adjustment

Adjust the master black with the MASTER BLACK dial.

5-1-4 Iris Adjustment

Set the IRIS control mode of the lens such that iris adjustment can be controlled from the camera.

Automatic adjustment

1 Set the AUTO/MANUAL switch to AUTO.
The iris is automatically set to the optimum value.

2 Perform fine adjustment by turning the dial, if necessary.

Manual adjustment

1 Set the AUTO/MANUAL switch to MANUAL.

2 Turn the dial to adjust the iris.
To close the iris, turn the dial counterclockwise.
To open the iris, turn the dial clockwise.

5-1-5 Gamma Adjustment

Automatic adjustment

Set the GAMMA switch to PRESET.
The gamma is automatically adjusted to the preset value.

Manual Adjustment

1 Set the GAMMA switch to MANUAL.

2 Turn the control to adjust the gamma.

5-1-6 Knee Point Adjustment

What is knee point adjustment?

This adjustment is performed to adjust the white gradation. This adjustment is carried out by dropping the gain of those parts of the picture over 100% with a curve that resembles a bent knee, so that detail in the white parts can be reproduced. If the slope is different for each of the R, G, and B channels, unnecessary color is added to those white parts over 100% (white parts cannot be reproduced in pure white).

- You can shoot a white subject having very strong contrast, and successfully reproduce it.
- You can shoot a subject against the light or under bright lighting.

Automatic/manual adjustment

1 Prepare for the adjustment.

Subject	Subject to be adjusted or gray scale
Light source (light condition)	Use the same light source as that used for the actual shooting.
Focus	Set the focus correctly.
Filter	Set according to the color temperature of the light source.
Measuring instruments	Waveform monitor and video monitor

2 Set the KNEE switch to the appropriate position for shooting.

AUTO : Automatically adjusts the knee point to the optimum value.

PRESET : Automatically adjusts the knee point to the currently set value.

MANUAL : The knee point can be adjusted manually with the dial.

5-1-7 Detail Adjustment

What is detail adjustment?

The adjustment is performed to adjust the contour enhancement amount according to the shooting purpose or intention.
As you increase the amount, the contour is emphasized, producing a sharp picture. As you decrease the amount, the contour is de-emphasized, producing a soft picture.

Adjustment

1 Prepare for the adjustment.

Subject	Subject to be adjusted or gray scale
Light source (light condition)	Use the same light source as that used for the actual shooting.
Focus	Set the focus correctly.
Filter	Set according to the color temperature of the light source.
Measuring instruments	Video monitor

2 Use the DETAIL control to adjust the detail.
Turn clockwise to increase the enhancement amount.
Turn counterclockwise to decrease the amount.

5-2 Setting Up

5-2-1 Setting the Gain

Use the GAIN dial to switch the gain of the video amplifier to 0, 6, 12 or 18 dB. This dial functions in the same way as the GAIN switch of the camera. When the settings of the camera and remote control unit differ, the remote control unit setting takes priority.

5-2-2 Setting the Shutter Speed

You can set the shutter speed to OFF, 1/100, 1/125, 1/250, 1/350, 1/500, 1/1000, 1/2000, or CLS.

Setting the shutter speed

1 Turn the SHUTTER dial of the remote control unit to select the shutter speed.

2 To set the fine shutter speed to between 1/60.4 and 1/350 seconds, select CLS (Clear Scan) and then set the fine shutter speed with the menu operation with the adaptor.

For an explanation of menu operation, refer to subsection "3-5-2 Menu Operation."

5-3 File Operation

5-3-1 File System

The system can store the scene file, which contains adjustment data for the camera.
File operations such as file storage and recall are performed from the remote control unit. The items of adjustment data that can be stored vary with the type of camera being used.

Scene files

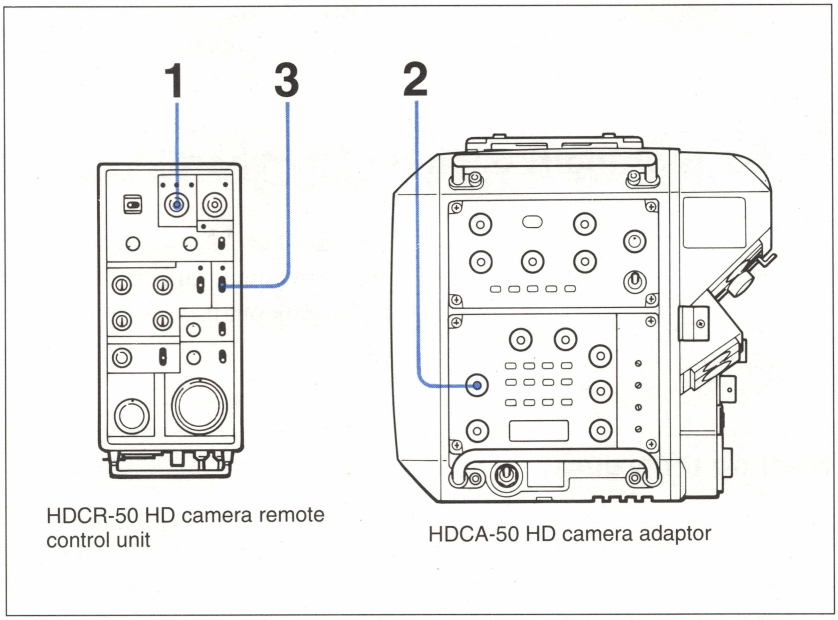
Scene files store painting data for different scenes.
For example, data prepared at rehearsal for a particular scene may be stored in a scene file. When shooting the scene, you can recall the scene file to automatically reproduce the same camera settings as those used at rehearsal.
The contents of scene files remain unchanged until new data is stored in them.
Up to four scene files can be created.

5-3-2 Data Stored to a Scene File

Data item	Data contents	Operation from
BLACK	Adjusted black balance value	HDCR-50
WHITE	Adjusted white balance value	HDCR-50
GAMMA	Set gamma value	HDCR-50
GAIN	Set gain value	HDCR-50
ND.CC FILTER POSITION	Filter number	HDCA-50
KNEE POINT	Adjusted knee point value	HDCR-50
DETAIL GAIN	Adjusted detail gain value	HDCR-50
SHUTTER SPEED	Set shutter speed value	HDCR-50 or menu operation of HDCA-50
Super EVS	Super EVS mode number	VF menu operation of HDCA-50

5-3-3 Registration and Call

Registering (storing) a file



Registering a file

1 Set the REMOTE PART/REL/ABS button of the remote control unit to REL (relative mode) or ABS (absolute mode), then adjust each data item.

2 Press the adaptor's FILE button as many times as necessary to light the corresponding lamp of the desired file number.

3 Press the FILE button of the remote control unit to store each adjustment data item to the designated scene file.
When data has already been stored to that file, it is overwritten with the new data.
When the file is registered properly, the corresponding lamp lights. If the registration fails, the lamp flashes.

Calling (retrieving) a file

Press the FILE button of the adaptor as many times as necessary to light the corresponding light of the desired file number. The designated file is retrieved.

5-4 Switching the Camera Output Signal and Starting/Stopping VTR Recording

5-4-1 Switching the Camera Output Signal

Set the CAM/BARS/TEST switch to the appropriate position.

CAM : Outputs the video signals shot by the camera directly to the monitor. This is the normal setting while shooting.

BARS : Outputs the color bar signal to the monitor.

TEST: Outputs the test signal to the monitor.

5-4-2 Starting/Stopping VTR Recording

You can start and stop recording of the VTR from the remote control unit. This function is activated only when the command protocols of the VTR being used for recording match those of the remote control unit.

Starting recording

Press the VTR START button.
The REC/TALLY lamp lights and the VTR starts recording.

Stopping recording

While recording, press the VTR START button.
The REC/TALLY lamp goes off and the VTR stops recording.

5-5 Switching the Operating Range of the Remote Control Unit

5-5-1 Switching the Operating Range

You can use the REMOTE PART/REL/ABS button to switch the operating range of the remote control unit.

PART: Only the IRIS button is effective. When a scene file is retrieved, the operating range is automatically set to this position.

REL (relative): Each control or dial operates in relative mode. When you turn a control or dial clockwise, the value is incremented relative to the currently set value. Turning the control or dial counterclockwise decrements the value relative to the currently set value. Select this position to finely adjust the preset values stored in a scene file.

ABS (absolute): Each control or dial operates in absolute mode. Turning a control or dial increments or decrements a value not relative to the currently set value. Select this position to set the data item for a scene file.

5-5-2 Operating Range

Function	Setting of PART/REL/ABS		
	PART	REL	ABS
SHUTTER dial	×	○	○
W/B WHITE dials	×	R	R
W/B BLACK dials	×	R	R
WHITE/BLACK switch	×	○	○
KNEE dial	×	R [a)]	A
KNEE switch	×	○	○
MASTER BLACK dial	×	R	A
GAIN dial	×	○	○
CAM/BARS/TEST switch	×	○	○
FILE button	×	○	○
GAMMA control	×	R [a)]	A
GAMMA switch	×	○	○
DETAIL control	×	R	A
IRIS dial	A	A	A
IRIS AUTO/MANUAL switch	○	○	○

○ : Enabled.
× : Disabled.
R : Operates in relative mode.
A : Operates in absolute mode.
a) Operates only when the switch is set to MANUAL.

5-6 INCOM (Intercom) Operation

You can communicate with the camera engineer, the signal distributor operator, external engineer, and external producer from the remote control unit by using the INCOM (intercom) line.
For details, refer to section "4-4 INCOM (Intercom) Operation."

5-6-1 Using the INCOM (Intercom) Lines

1 Connect the INCOM (intercom) lines.
For an explanation of INCOM connection, refer to subsection "4-4-1 Example INCOM (Intercom) Connection."

2 Adjust the level of the received INCOM audio signal with the LEVEL control.

3 Set the COMMON/PRIVATE switch to the appropriate position to switch the external INCOM lines.
COMMON: Connects external INCOM lines.
PRIVATE: Disconnects external INCOM lines.

5-6-2 Calling the Camera Engineer and Turning the INCOM (Intercom) Microphone On/Off

Use the CALL and MIC ON/OFF switch to call a camera engineer or to turn an INCOM headset microphone on and off.
CALL: Lights the tally lamp of the HDCA-50 camera adaptor.
When the camera adaptor CALL button is pressed, the CALL lamp of the remote control unit lights.
ON: Turns the INCOM headset microphone on.
OFF: Turns the INCOM headset microphone off.

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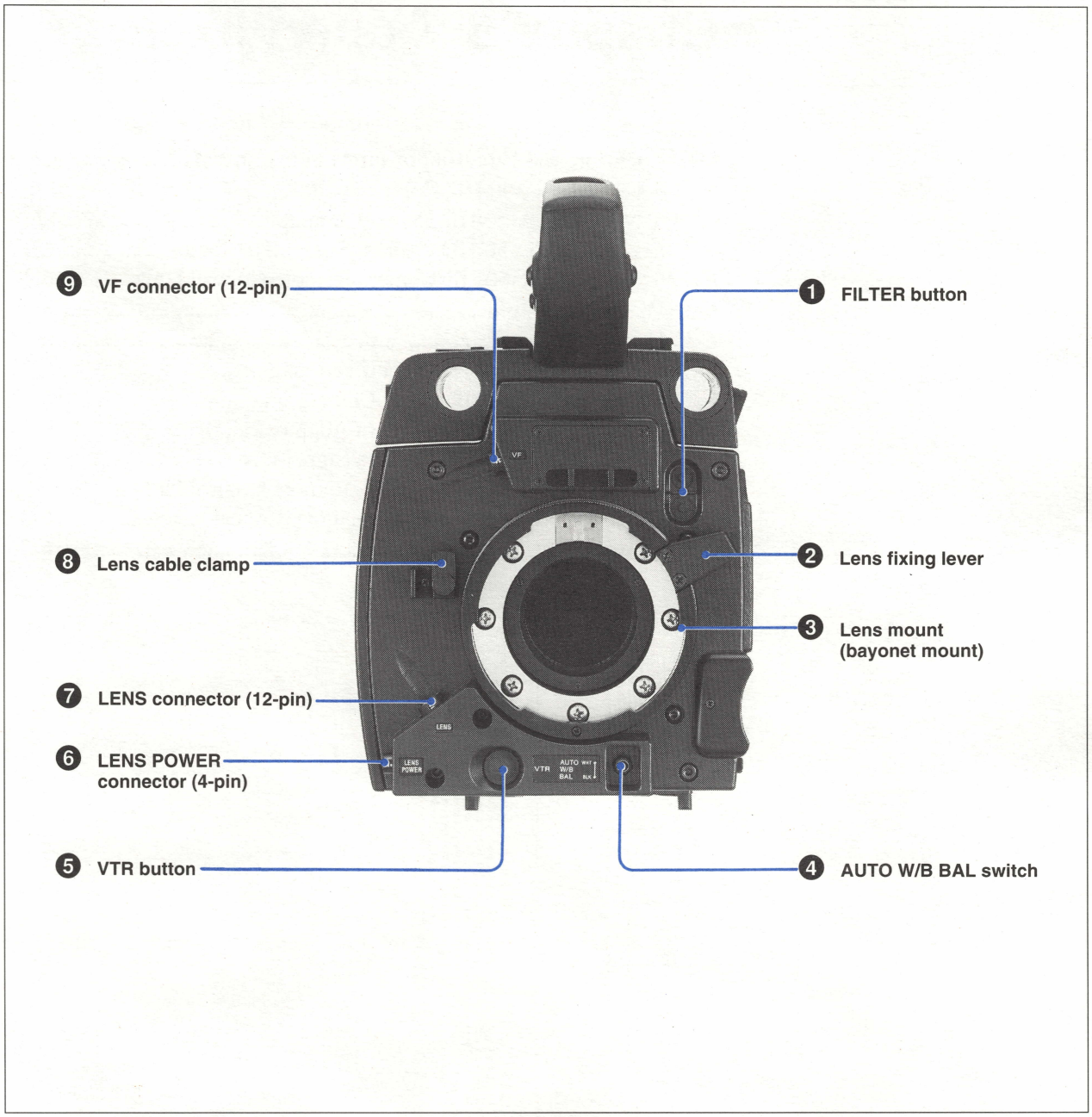
6-1 Location and Function of Parts and Contorls

6-1-1 HDC-500 HD Color Camera

Front panel



Front

❶ FILTER button
Selects the filter.

❷ Lens fixing lever
After attaching the lens in the lens mount ❸, turn the lens mount ring clockwise with this lever to secure the lens.

❸ Lens mount (bayonet mount)
Attach the lens. When using the camera without a lens, always keep the cap in place.

❹ AUTO W/B BAL (automatic white/black balance) switch
Adjusts white and black balance automatically. Also used to select an item from a menu.

❺ VTR button
Recording can be started and stopped from a portable VTR (on the market in the near future), which is connected to the VTR connector of the HDCA-50 HD camera adaptor.

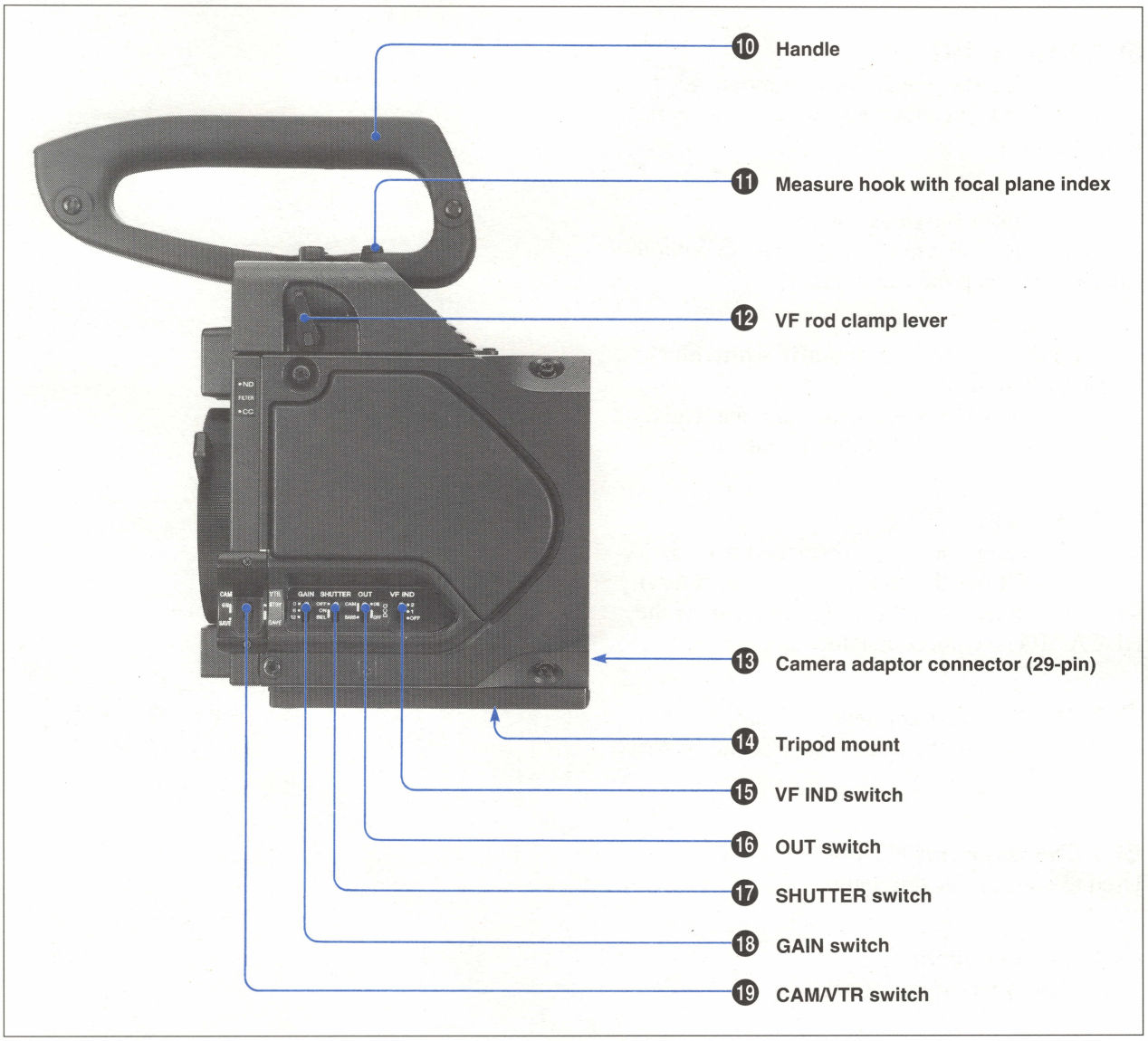
❻ LENS POWER connector (4-pin)
Supplies power to the large-size lens and box-size lens.

❼ LENS connector (12-pin)
Used to connect the lens cable.

❽ Lens cable clamp
Clamps the lens cable.

❾ VF (viewfinder) connector (12-pin)
Used to connect the viewfinder cable.

Side panel



Side panel

⑩ Handle

Carry the camera by holding this handle. Also, you can shoot a subject from low angles by holding this handle. Remove this handle when mounting the 7-inch viewfinder or large-size lens.

⑪ Measure hook with focal plane index

⑫ VF (viewfinder) rod clamp lever

⑬ Camera adaptor connector (29-pin)

Used to connect to the CHU connector of the camera adaptor.

⑭ Tripod mount

Attach the camera directly to the tripod or by using the tripod attachment.

⑮ VF IND (viewfinder indication) switch

Switches the display mode in the viewfinder screen.

2: Displays the items set in the menu continuously.

1: Displays the items newly set in the menu for a few seconds.

OFF: Erases the viewfinder display.

⑯ OUT (output signal/dynamic contrast control) switch

Selects the video signal output to the viewfinder/video monitor/VTR. You can use the DCC (dynamic contrast control) function when selecting the video signal that is being shot by the camera.

CAM DCC ON: Outputs the video signal that is being shot by the camera. The DCC circuit becomes effective.

CAM DCC OFF: Outputs the video signal that is being shot by the camera. The DCC circuit becomes ineffective.

BARS DCC OFF: Outputs color bar signals. The DDC circuit becomes ineffective.

Set this switch to this position in the following cases.

- When adjusting the video monitor
- When outputting the color bar signals
- When changing to VF menu mode (when the HDCA-50 is connected)

⑰ SHUTTER switch

Set this switch to ON when using the electronic shutter. Whenever setting the switch to the SEL side, the shutter speed is changed.

⑱ GAIN switch

Adjusts the video output level. When the lighting is insufficient and the picture on the monitor is too dim, set this switch to the appropriate position.

0: Normally set the switch to this position.

6: Raises the video output level by 6 dB.

12: Raises the video output level by 12 dB.

⑲ CAM/VTR switch

Set the switch to the appropriate position according to the shooting condition to reduce power consumption.

CAMERA ON VTR STBY: Turns on the power of the camera and causes the VTR to enter standby mode. By pressing the VTR button, the VTR starts recording immediately. Set the switch to this position in the following cases.

- When recording continuously with little pausing
- When you do not wish to loose the shooting chance of the important scene.

CAMERA ON VTR SAVE: Turns on the power of the camera and causes the VTR to enter save mode. By pressing the VTR button, the VTR is servo-locked, then starts recording.

Set the switch to this position in the following cases.

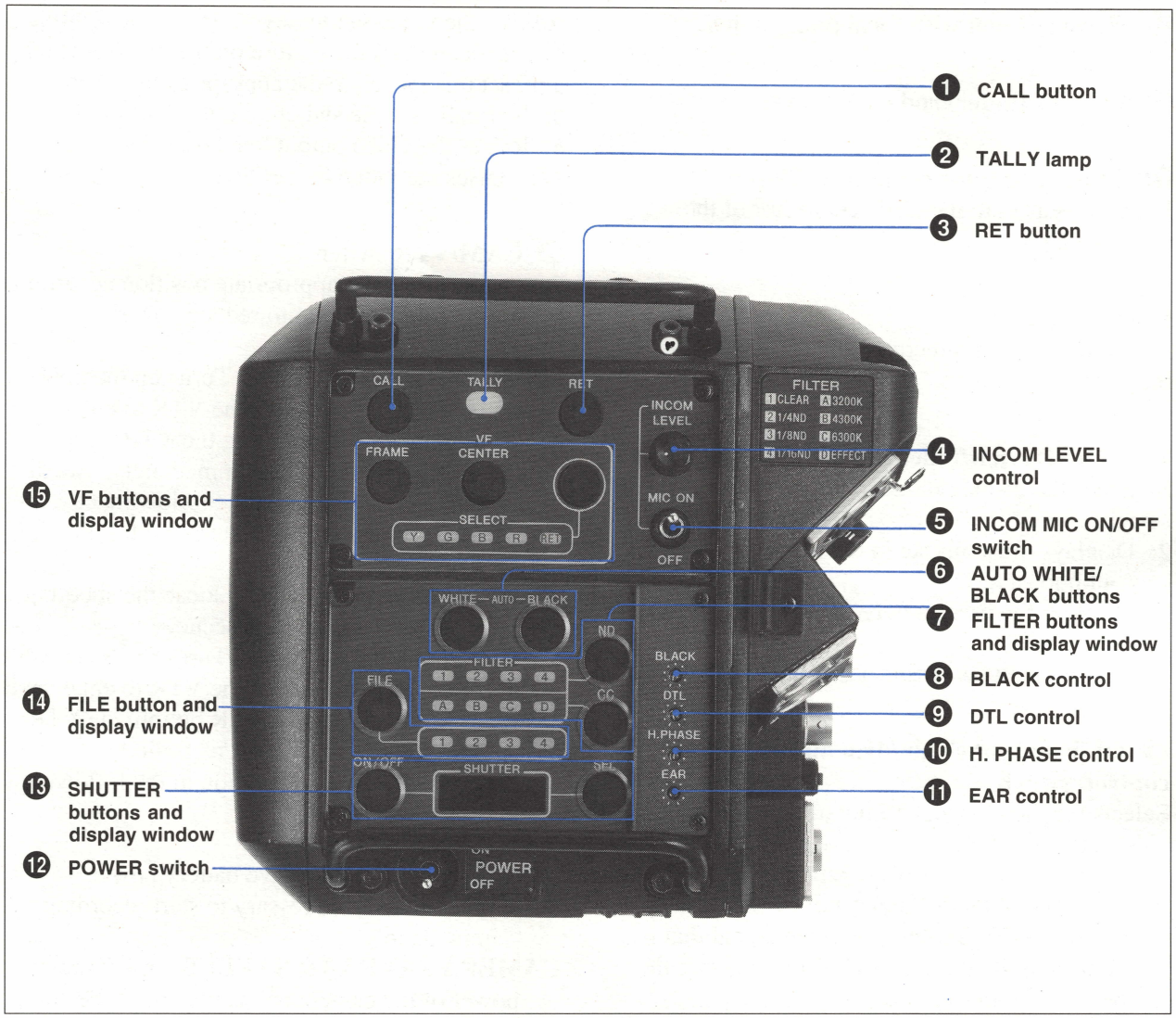
- When performing setup
- When you wish to save battery power
- When it is not necessary to start recording immediately

CAMERA SAVE VTR SAVE: Turns off the power of the camera and causes the VTR to enter save mode.

Set the switch to this position while shooting is paused.

6-1-2 HDCA-50 HD Camera Adaptor

Operation panel



Operation panel

❶ CALL button
The tally lamp on the HDCR-50 lights while this button is held down.

❷ TALLY lamp
Lights when called with an external tally or call button. The lamp will not light depending on the internal switch setting.
For the internal switch setting, refer to the maintenance manual supplied with the system.

❸ RET (return video) button
The return video appears in the viewfinder while this button is held down. The Y signal is output when RET (return video) has been selected with the VF SELECT button ⓯.

❹ INCOM LEVEL control
Adjusts the level of the received INCOM audio.

❺ INCOM MIC (microphone) ON/OFF switch

ON: Turns on the microphone of the headset for INCOM.

OFF: Turns off the microphone of the headset for INCOM.

❻ AUTO WHITE/BLACK (automatic white/black balance) buttons

WHITE: Adjusts the white balance automatically.

BLACK: Adjusts the black balance and black set automatically.

❼ FILTER buttons and display window

ND: Changes the ND filter in the order of 1, 2, 3, 4 and 1... whenever you press this button.

1	CLEAR	Completely transparent
2	1/4 ND	Reduces the light quantity to 1/4.
3	1/8 ND	Reduces the light quantity to 1/8.
4	1/16 ND	Reduces the light quantity to 1/16.

CC: Changes the CC filter in the order of A, B, C, D and A.. whenever you press this button.

A	3200 K	Use this filter when the color temperature of the incoming light is 3200 K.
B	4300 K	Use this filter when the color temperature of the incoming light is 4300 K.
C	6300 K	Use this filter when the color temperature of the incoming light is 6300 K.
D	EFFECT	Cross filter for special effect

❽ BLACK (master black) control

Adjusts the master black level.

❾ DTL (detail gain) control

Adjusts the contour enhancement amount.

❿ H (horizontal) PHASE control

Finely adjusts the horizontal phase for external synchronization.

⓫ EAR control

Adjusts the volume of the VTR audio signal input from the EAR connector.

⓬ POWER switch

ON: Turns on the power of the camera.

OFF: Turns off the power of the camera.

⓭ SHUTTER buttons and display window

ON/OFF button

Turns the electronic shutter on and off.

ON: Activates the electronic shutter function.

OFF: Deactivates the electronic shutter function.

SEL (shutter speed selection) button

Sets the shutter speed to OFF, 1/100, 1/125, 1/250, 1/350, 1/500, 1/1000, 1/2000, or CLS (clear search for continuous increment and decrement).

When you select the CLS, you can set a fine shutter speed to between 1/60.4 and 1/350.

For the details, refer to the subsection "3-2-3 Setting the Shutter Speed."

Shutter speed display window

Displays the shutter speed.

Example: 1000 (on the display): 1/1000 second shutter speed

⓮ FILE button and display window

FILE (file selection) button

Retrieves the stored scene file. Whenever you press this button, the file changes in the order of OFF, 1, 2, 3, 4, OFF. . .

When you are not going to use a scene file, select OFF.

File number display window

The number corresponding to the selected scene file lights. When OFF is selected, no lamp lights.

⓯ VF (viewfinder) buttons

Selects the indication in the viewfinder or the output signals.

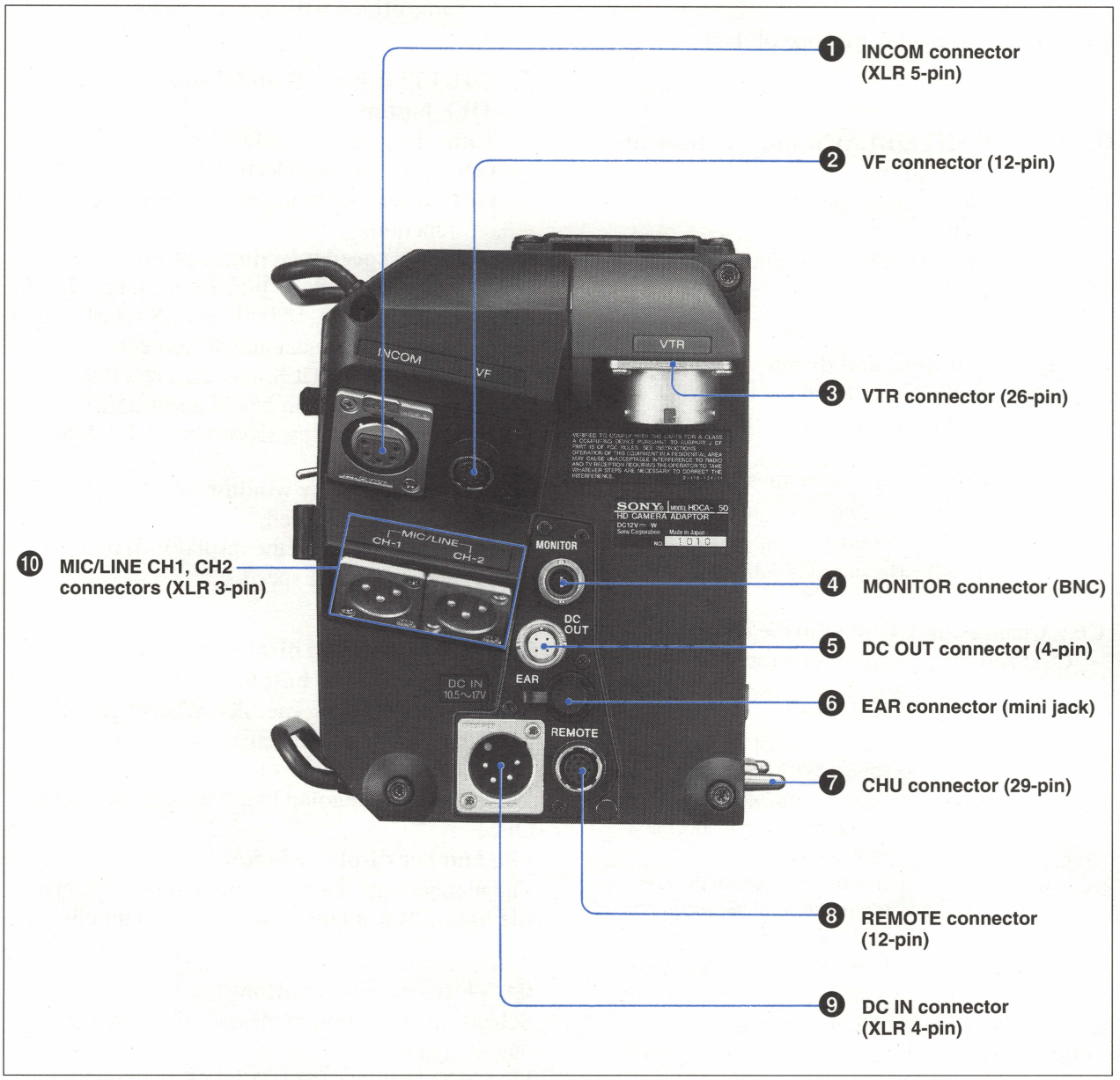
FRAME: Displays the HD safety zone on the viewfinder screen. Press this button again. The safety zone disappears.

CENTER: Displays the center marker on the viewfinder screen. Press this button again. The center marker disappears.

SELECT: The displayed signal changes in the order of Y, G, B, R, RET, Y....whenever you press this button.

Y	Y signal
G	G component
B	B component
R	R component
RET	Return video

Connector panel



Connector panel

❶ INCOM connector (XLR 5-pin)
Inputs/outputs the INCOM audio signal.

❷ VF connector (12-pin)
Use to connect the viewfinder.

❸ VTR connector (26-pin)
Used to connect the HDCD-50 HD camera signal distributor.

❹ MONITOR connector (BNC)
Outputs the signal of one of the Y/G/B/R/RET signals (depending on the VF SELECT button setting). Used to connect a (video) monitor.

❺ DC OUT (DC power output) connector (4-pin)
Supplies power for the script light.

❻ EAR (earphone) connector (mini jack)
Used to connect a pair of headphones or an earphone. Outputs the audio signal from the VTR.

❼ CHU (camera head unit) connector (29-pin)
Connect the camera adaptor connector of the HDC-500 HD color camera.

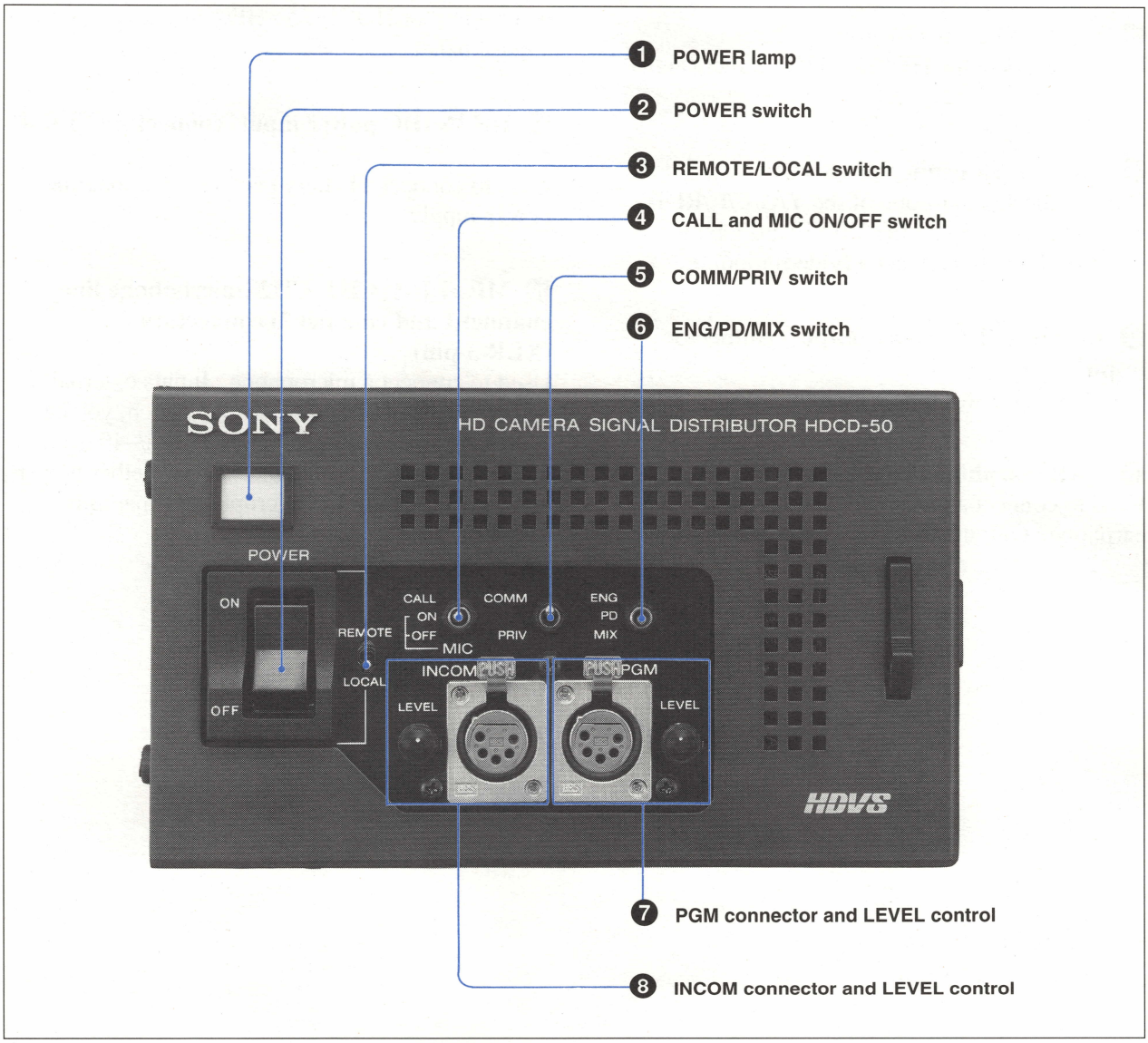
❽ REMOTE connector (12-pin)
Used to connect the HDCR-50 HD camera remote control unit or HDCR-350 HD camera remote control panel.

❾ DC IN (DC power input) connector (XLR 4-pin)
Used to connect a battery pack or other external power supply.

❿ MIC/LINE CH1, CH2 (microphone line channel 1 and channel 2) connectors (XLR 3-pin)
Used to connect a microphone. Inputs external audio signals. Using the internal switch, you can switch the microphone input (–60 dBs/–40 dBs) and line input (–20 dBs) and select whether power is to be supplied to the microphone (Phantom +48 V).
For the internal switch setting, refer to the maintenance manual supplied with the system.

6-1-3 HDCD-50 HD Camera Signal Distributor

Front panel



Front panel

❶ POWER lamp
Lights in red when the POWER switch ❷ is set to ON. Blinks in red if the distributor overheats. Lights steadily in red if the power supply block reaches its breakdown temperature.

❷ POWER switch
ON: Turns the distributor on. (AC power supply)
OFF: Turns the distributor off. (AC power supply)

❸ REMOTE/LOCAL switch
This switch is activated only when the unit operates on AC power supply.
REMOTE: Enables the camera's power supply to be turned on and off from the remote control unit connected to the distributor.
LOCAL: Enables the camera's power supply to be turned on and off with the POWER switch ❷ of the distributor. Select this position when you wish to connect the HDCR-50 remote control unit or HDCR-350 remote control panel to the camera adaptor.

❹ CALL and MIC (microphone) ON/OFF switch
CALL: Lights the tally lamp of the camera adaptor to call the camera engineer.
ON: Turns the INCOM headset microphone on. (Select this position when using INCOM microphones)
OFF: Turns the INCOM headset microphone off. (Select this position when you are not using INCOM microphones)

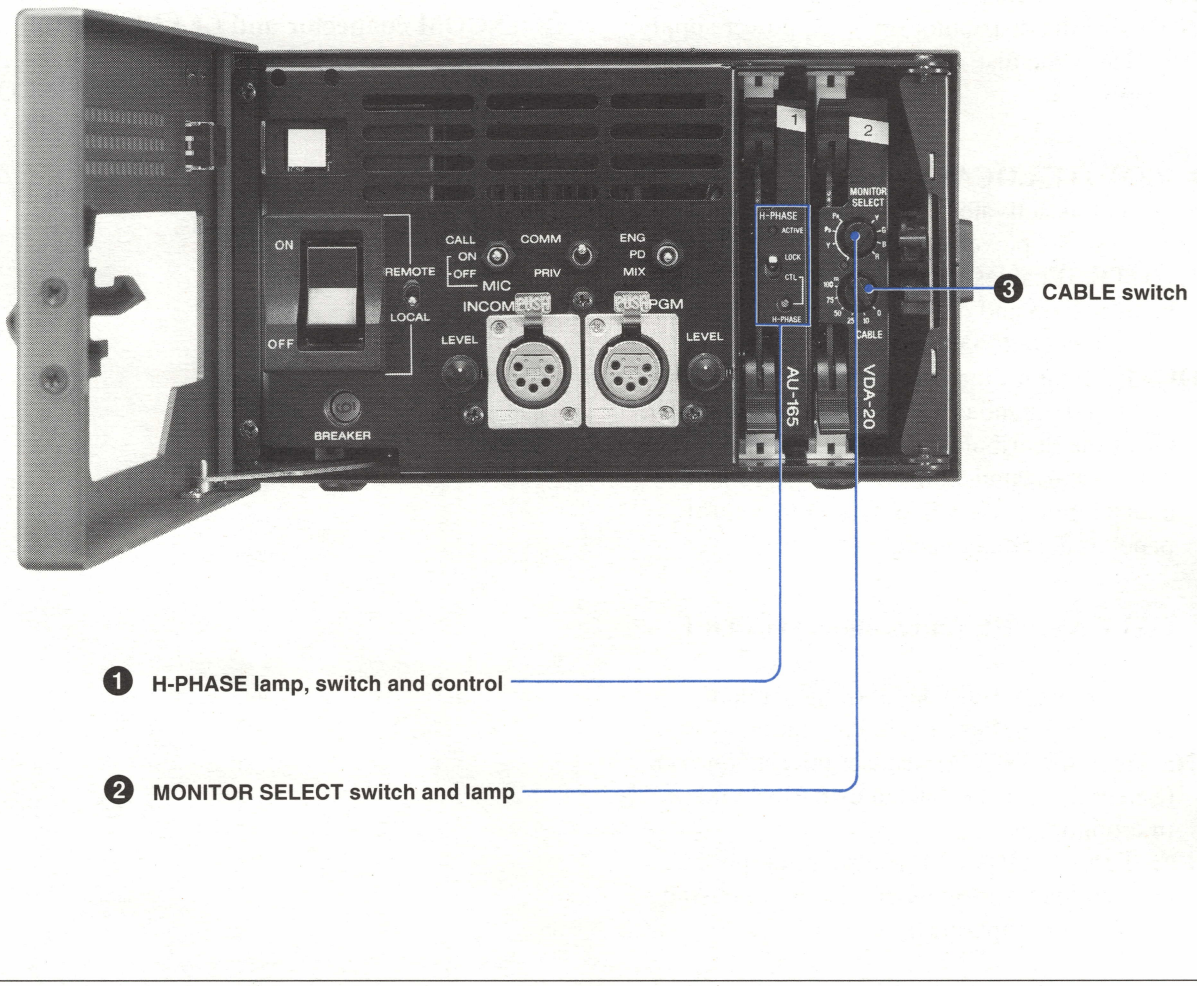
❺ COMM/PRIV (INCOM common/private) switch
COMM: Connects external INCOM lines.
PRIV: Disconnects external INCOM lines.

❻ ENG/PD/MIX (INCOM engineer/producer/mixture) switch
Switches the external INCOM lines.
ENG: Uses the engineer line only.
PD: Uses the producer line only.
MIX: Uses both the engineer and producer lines at the same time.

❼ PGM (program audio) connector and LEVEL control (XLR 5-pin or No. 110 jack)
PGM connector: Outputs the program audio signals.
LEVEL control: Used to adjust the volume of the output program audio signals.

❽ INCOM connector and LEVEL control (XLR 5-pin or No. 110 jack)
INCOM connector: Used to connect the INCOM headset. Inputs and outputs INCOM audio signals.
LEVEL control: Used to adjust the volume of the output INCOM audio signals.

Sub-panel



Sub-panel

❶ H-PHASE (horizontal phase) lamp, switch and control

You can adjust the horizontal phase only when the HDCR-50 camera remote control unit or the HDCR-350 camera remote control panel is connected to the distributor. (The H PHASE switch on the IF-346 board of the HDCA-50 should be set to REMOTE mode.)

ACTIVE lamp

Lights when the HDCR-50 remote control unit or the HDCR-350 remote control panel is connected to the distributor. While this lamp is lit, you can adjust the horizontal phase.

H-PHASE switch

LOCK: Locks the horizontal phase set with the H-PHASE control.
Normally, keep the switch set to this position.

CTL: Select this position to adjust the horizontal phase.

H-PHASE control

Adjusts the horizontal phase while viewing the image on the monitor. Before making adjustment, set the H-PHASE switch to CTL.

❷ MONITOR SELECT switch and lamp

MONITOR SELECT switch

Selects the signals output from the MONITOR connector.

G/Y: Outputs G (or Y) signals.
B/PB: Outputs B (or PB) signals.
R/PR: Outputs R (or PR) signals.

To switch the output signal between GBR and Y/PB/PR, change the settings of the signal select switches inside the HDCA-50 camera adaptor.
For an explanation of selecting the output signal with the internal switches, refer to the supplied maintenance manual.

Lamp

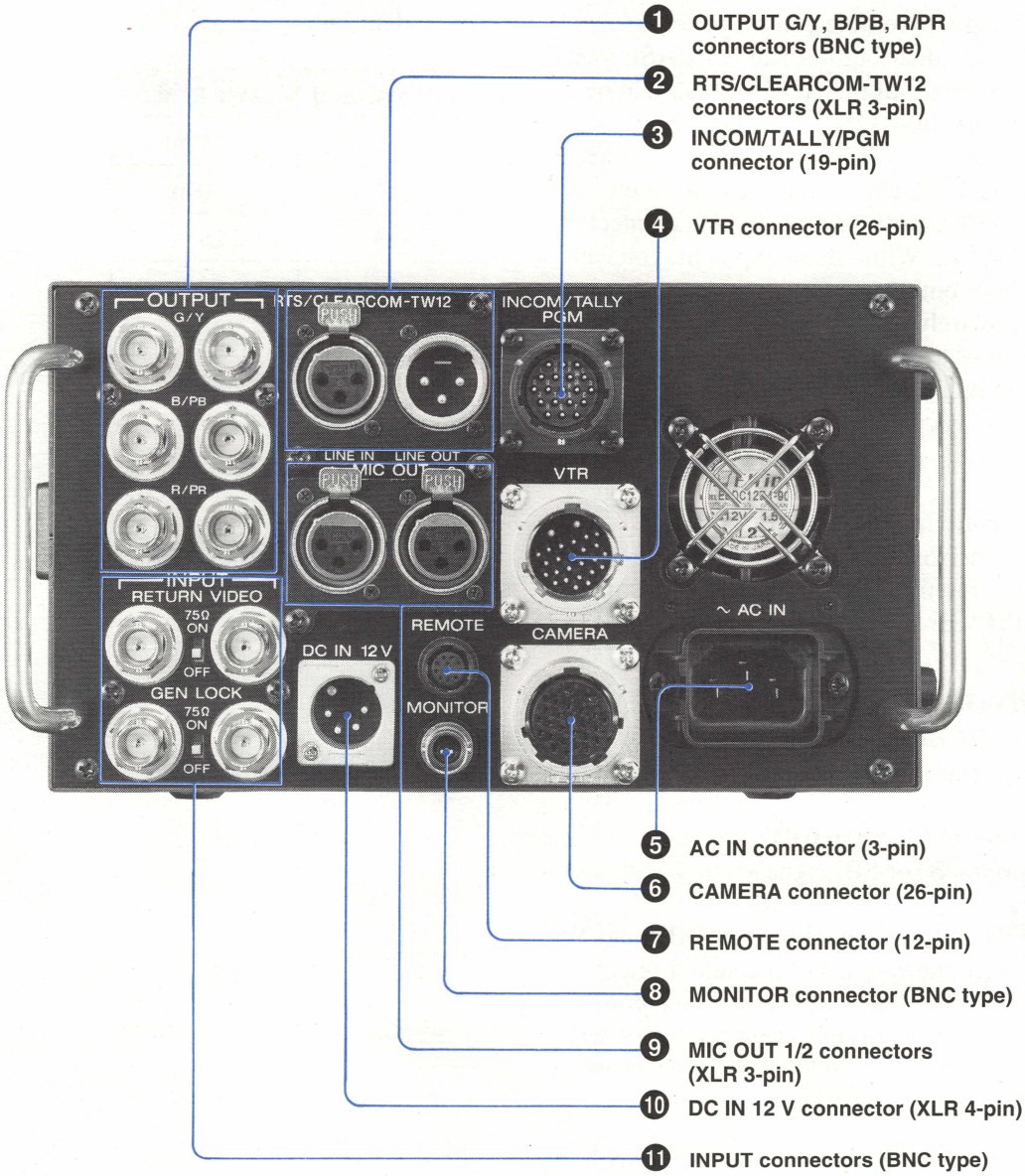
Lights when Y/PB/PR signals are selected with the internal signal select switch of the HDCA-50 camera adaptor. Either of the Y/PB/PR signals is output from the MONITOR connector.

❸ CABLE switch

Set to 100, 75, 50, 25, 10 or 0, according to the length of the HDCZ-10/25 multi-cable connecting the HDCA-50 camera adaptor to the HDCD-50 signal distributor.

Switch setting	Cable length
0	5 m
10	10 m
25	25 m
50	50 m
75	75 m
100	100 m

Rear panel



Rear panel

❶ OUTPUT G/Y, B/PB, R/PR connectors (BNC type)
Output two channels each for the GBR or Y, PB, PR signals. Used to connect a monitor.
To switch the output signals between GBR and Y/PB/PR signals, change the settings of the signal select switches inside the HDCA-50 camera adaptor.
For an explanation of selecting the output signal with the internal switches, refer to the supplied maintenance manual.

❷ RTS/CLEARCOM-TW12 connectors (XLR 3-pin)
LINE IN connector: Inputs RTS/CLEARCOM for external INCOM lines.
LINE OUT connector: Outputs RTS/CLEARCOM for external INCOM lines.

❸ INCOM/TALLY/PGM connector (19-pin)
Inputs and outputs the external INCOM line (engineer and producer line) signals, tally signals, and program audio signals.

❹ VTR connector (26-pin)
Used to connect a portable VTR for recording by using the HDCZ-10/25 multi-cable.

❺ AC IN (AC power input) connector (3-pin)
Used to connect the unit to an AC outlet using the supplied AC power cord. Automatically switches the power supply between 100 V AC and 220 V AC.

❻ CAMERA connector (26-pin)
Used to connect to the VTR connector of the HDCA-50 camera adaptor using the HDCZ-10/25 multi-cable. You can also supply power to the camera adaptor through this connector.

❼ REMOTE connector (12-pin)
Used to connect the HDCR-50 HD camera remote control unit or HDCR-350 HD camera remote control panel.

❽ MONITOR connector (BNC type)
Outputs the video signal selected with the MONITOR SELECT switch on the distributor sub-panel. Used to connect a monitor.

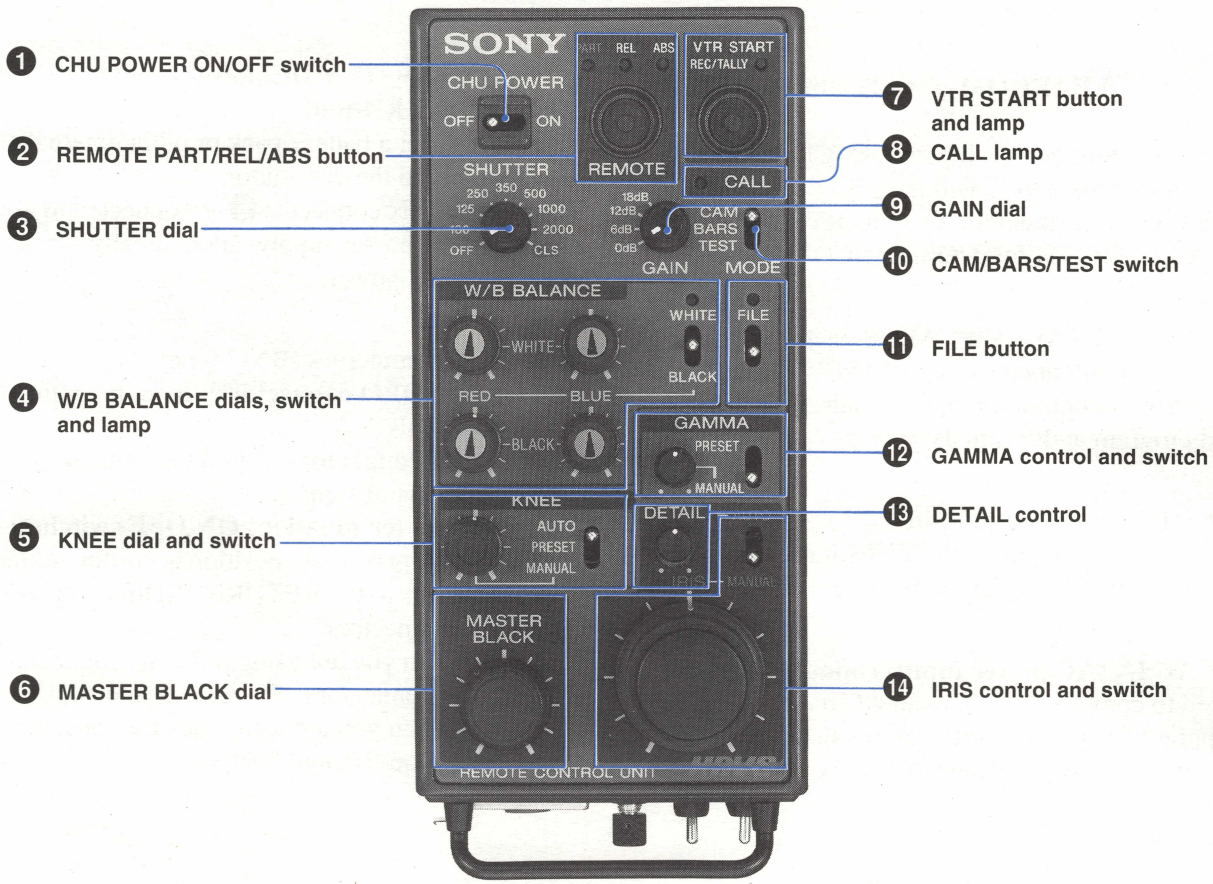
❾ MIC OUT (microphone output) 1/2 connectors (XLR 3-pin)
Outputs the external audio signals from the camera. Used to connect an audio amplifier or switcher.

❿ DC IN 12 V (12 V DC power input) connector (XLR 4-pin)
Used to connect a battery pack or other external power supply to the distributor.
When the AC IN connector ❺ is connected to an AC outlet, the power supply automatically switches to AC power.

⓫ INPUT connectors (BNC type)
RETURN VIDEO connectors: Input the return video signals.
GEN LOCK connectors: Input the genlock (external sync) signals.
75Ω (75-ohms termination) ON/OFF switches: Set to the appropriate position according to the connections to the RETURN VIDEO and GEN LOCK connectors.
ON: When you are using only one connector. (The connector is 75-ohms terminated.)
OFF: When you are using the other channel for "loop-through" output.

6-1-4 HDCR-50 HD Camera Remote Control Unit

Front panel



Front panel

❶ CHU (camera head unit) POWER ON/OFF switch

Turns the camera power supply on and off. This switch is activated only when the unit is operating on AC power and the REMOTE/LOCAL switch in the power block of the HDCD-50 camera signal distributor is set to REMOTE. When the switch is set to LOCAL, the signal distributor supplies power to the camera.

ON: Supplies power to the camera

OFF: Does not supply power to the camera

❷ REMOTE PART/REL/ABS button

Switches the operating range of each switch, dial, and control of the remote control unit.

PART: Only the IRIS control and switch are activated. When a scene file is called, the operating range is automatically set to this position.

REL (relative): Each control, dial and switch operates in the relative mode. Select this position to finely adjust the currently set values of a scene file.

ABS (absolute): Each control, dial, and switch operates in the absolute mode. Select this position to set the data items for a scene file.

❸ SHUTTER (shutter speed) dial

Switches the shutter speed to OFF, 1/100, 1/125, 1/250, 1/350, 1/500, 1/1000, 1/2000, or CLS.

❹ W/B (white/black) BALANCE dials, switch and lamp

W/B BALANCE dials

WHITE dials: Enables manual adjustment of white balance.

BLACK dials: Enables manual adjustment of black balance.

WHITE/BLACK switch

WHITE: Adjusts the white balance automatically.

Center: Normally, keep the switch set to this position.

BLACK: Adjusts the black balance automatically.

Lamp

Lights for about two seconds once automatic white/black balance adjustment has been completed. Flashes every 0.5 seconds for about 4 seconds if the automatic adjustment fails.

❺ KNEE dial and switch

AUTO: Automatically adjusts the knee point to the optimum value.

PRESET: Automatically adjusts the knee point to the preset value.

MANUAL: Enables manual knee point adjustment with the dial.

❻ MASTER BLACK dial

Adjusts the master black manually.

❼ VTR START button and lamp

VTR START button

Starts and stops recording of the VTR.
This button works only when the command protocols of the VTR match those of the remote control unit.

REC/TALLY lamp

Lights when the remote control unit is being called with the external tally button, or while the VTR is recording.

❽ CALL lamp

Lights when the remote control unit is being called with the external CALL button.

❾ GAIN dial

Sets the video amplifier gain to 0, 6, 12 or 18 dB. This dial functions in the same way as the GAIN switch of the camera. The setting of this dial takes priority.

❿ CAM/BARS/TEST (camera/color bars/test mode) switch

CAM: Normally, keep the switch to this position while shooting.

BARS: Outputs the color bar signal to the monitor.

TEST: Outputs the test signal to the monitor.

⓫ FILE button

Stores the current values set from the remote control unit to the scene file designated with the FILE button of the HDCA-50 camera adaptor.

⓬ GAMMA control and switch

PRESET: Normally, keep this switch to this position. The gamma is automatically adjusted to the preset value.

MANUAL: Select this position to manually adjust the gamma with the control.

⓭ DETAIL control

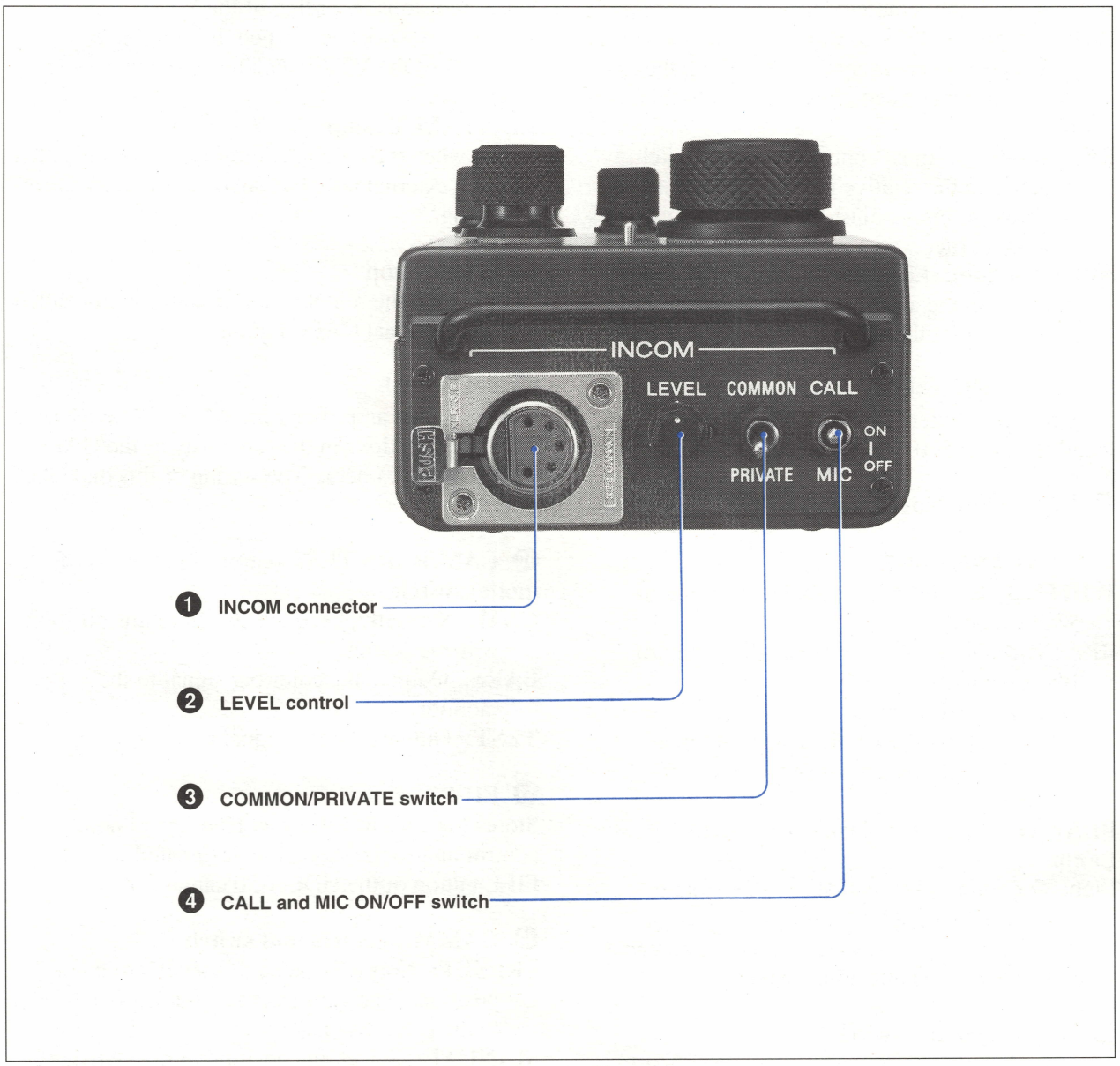
Adjusts the details.

⓮ IRIS control and switch

AUTO: Select this position to enable automatic iris adjustment.

MANUAL: Select this position to enable manual fine iris adjustment with the control.

Bottom panel



Bottom panel

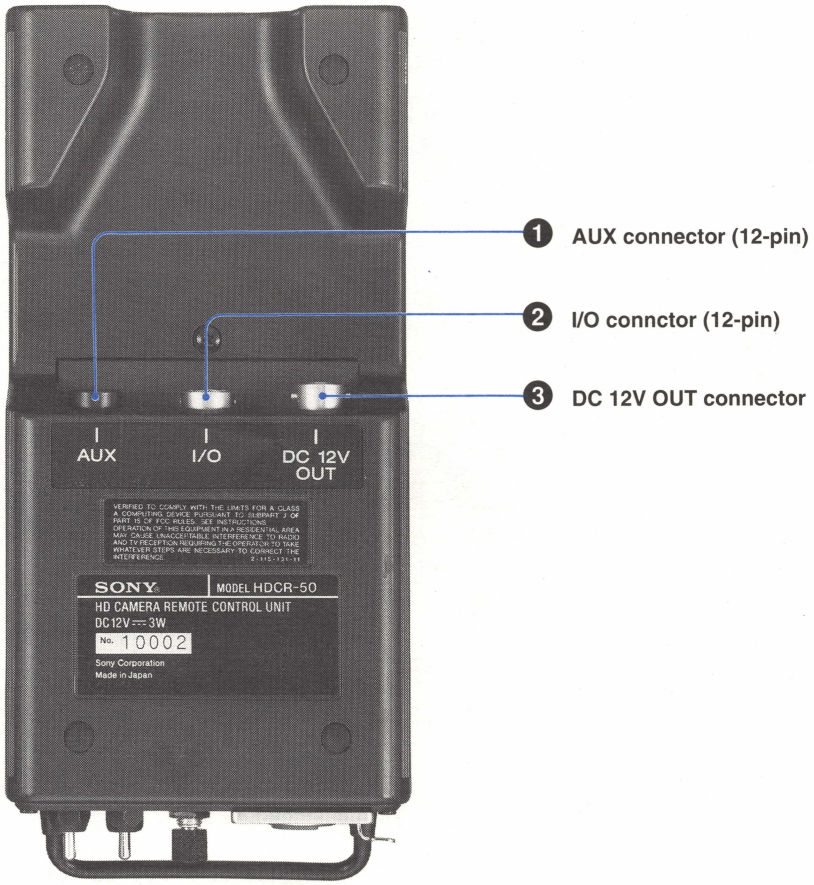
❶ INCOM (intercom) connector (XLR 5-pin or No. 110 jack)
Inputs and outputs INCOM audio signals. Used to connect the INCOM headset.

❷ LEVEL control
Adjusts the INCOM audio level from the INCOM connector ❶.

❸ COMMON/PRIVATE (INCOM common/ private) switch
COMMON: Connects external INCOM lines.
PRIVATE: Disconnects external INCOM lines.

❹ CALL and MIC ON/OFF switch
CALL: Turns the HDCA-50 camera adaptor tally lamp on.
ON: Turns the INCOM headset microphone on.
OFF: Turns the INCOM headset microphone off.

Rear panel



Rear panel

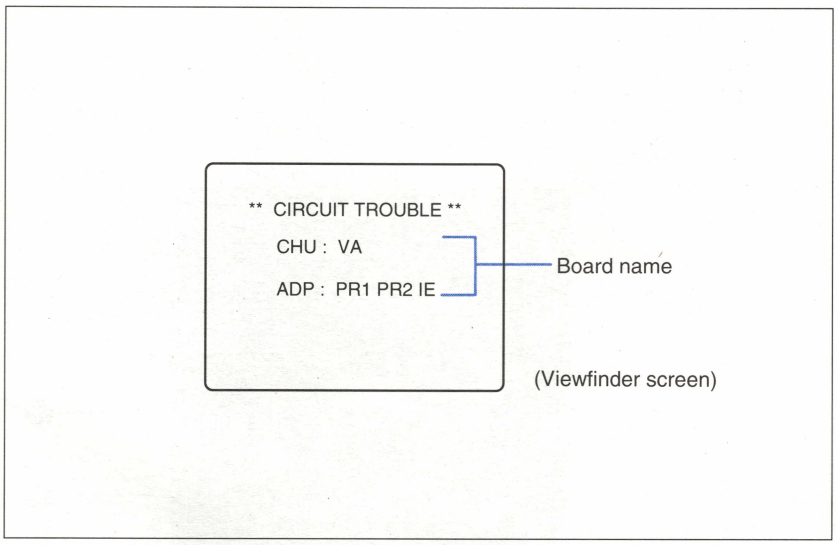
❶ AUX (auxiliary) connector (12-pin)
This connector is provided to enable future system expansion.

❷ I/O (input/output) connector (12-pin)
Used to connect the HDCD-50 camera signal distributor or the HDCA-50 camera adaptor.

❸ DC 12V OUT (12V DC power output) connector
Supplies power to a script light or other DC 12V device having a power consumption of 2W or less.

6-2 Warning System

This system features a self-diagnostic error display function. If a problem occurs with a board, the name of the faulty board appears on the viewfinder screen.



Message display example

Message	Sub-message (name of the board)	Cause
CHU	VA, SH, TG, SV	A problem has occurred with a board in the camera.
ADP	PR1, PR2, IE, SG, VDA	A problem has occurred with a board in the camera adaptor.

If these messages appear, turn off the system power and contact the Sony service facilities.

6-3 Specifications

6-3-1 Overall System Specifications

Sensitivity	F8 (2000 lx, 3200 K, reflection ratio 89.9 %)
S/N (video)	54 dB (Y: 30 MHz)
Registration error	0.025 %
Horizontal resolution	1000 TV lines
Horizontal frequency	33.75 KHz, 1125 lines/frame
Vertical frequency	60 Hz, 2:1 interlace
Power requirement	10.5 V DC to 17 V DC

6-3-2 HDC-500 HD Color Camera

Signal standard	BTA-S001, SMPTE 240M (1125/60, 16:9 aspect ratio, 3-value synchronization)
Pickup system	1-inch FIT type Hyper HAD sensor CCD
Picture elements	2,000,000
System	GBR 3-chip system
Spectrum system	F1.2 high-index prism system
Built-in filters	CC filters 3200 K, 4300 K, 6300 K, Cross filter ND filters Through, 1/4, 1/8, 1/16
VF output	One connector
Mass	4.6 kg (10 lb/10 oz) excluding the handle
Dimensions	200 x 164 x 177 mm (W/H/D) (7 1/4 x 6 5/8 x 7 inches) excluding the projecting parts and handle
Sensitivity	F8 (2000 lx, 3200 K, reflection ratio 89.9 %)
S/N (video)	54 dB (Y: 30 MHz)
Power consumption	29 W
Smearing	–100 dB
Lug	Under the measurement limit
Optic axis height	75.5 mm
Lens mount	1-inch HD standard bayonet mount, frangeback 68 mm
Scanning frequency	33.75 KHz
Connector	LENS connector (12-pin) LENS POWER connector (4-pin) VF connector (12-pin) Camera adaptor connector (29-pin)
Power requirement	10.5 V DC to 17 V DC
Warm-up time	2 sec.
Operating temperature	0 °C to +40 °C (+32 °F to +104 °F)
Storage temperature	–20 °C to +60 °C (–4 °F to +140 °F)

Supplied accessories	Handle (1) Rods (2) Tripod attachment (1) Carrying case (1) Extension board (1) Operation guide (1) Maintenance manual (1)

6-3-3 HDCA-50 HD Camera Adaptor

Input	INCOM connector (XLR 5-pin) DC IN connector (XLR 4-pin) MIC/LINE CH1, CH2 connectors (XLR 3-pin)
Output	MONITOR connector (BNC) VF connector (12-pin) DC OUT connector (4-pin) EAR connector (minijack)
Input/output	CHU connector (29-pin) VTR connector (26-pin) REMOTE connector (12-pin)
Power consumption	15 W
Mass	1.9 kg (4 lb 3 oz)
Dimensions	155 x 166 x 115 mm (W/H/D) (6 1/8 x 6 5/8 x 4 5/8 inches) excluding projecting parts and controls
Supplied accessories	No.110 jack INCOM panel (1) Female XLR 3-pin MIC panel (1) Operation manual (1) Maintenance manual (1)

6-3-4 HDCD-50 HD Camera Signal Distributor

Input	RETURN VIDEO connectors (BNC) GEN LOCK connectors (BNC) AC IN connector DC IN 12 V connector (XLR 4-pin)
Output	OUTPUT G/Y, B/PB, R/PR connectors (BNC) MONITOR connector (BNC) MIC OUT 1/2 connectors (XLR 3-pin)
Input/output	RTS/CLEARCOM-TW12 connectors (XLR 3-pin) INCOM/TALLY/PGM connector (19-pin)

	INCOM connector (XLR 5-pin) PGM connector (XLR 5-pin) REMOTE connector (12-pin) VTR connector (26-pin) CAMERA connector (26-pin)
Operating temperature	0 °C to +40 °C (+32 °F to +104 °F)
Storage temperature	–20 °C to +60 °C (–4 °F to +140 °F)
AC power requirements	100 V AC/220 V AC (automatically switched)
DC power requirements	10.5 V DC to 17 V DC (supplying power to distributor only, not to the HDCA-50; power supply to HDCA-50 possible)
Mass	7 kg (15 lb 7 oz)
Dimensions	200 x 118 x 336 mm (W/H/D) (7 7/8 x 4 3/4 x 13 1/4 inches) excluding projecting parts
Power consumption	380 VA
Supplied accessories	No. 110 jack INCOM PGM panel (1) Mail XLR 3-pin MIC panel (1) Expansion board (1) AC power cord (1) AC power plug adaptor (1) AC power cord with lead wires (1) INCOM 19-pin plug (1) Operation guide (1) Maintenance manual (1)

6-3-5 HDCR-50 HD Camera Remote Control Unit

Output	DC 12V OUT connector (4-pin)
Input/output	INCOM connector (XLR 5-pin) I/O connector (12-pin) AUX connector (12-pin)
Operating temperature	0 °C to +40 °C (+32 °F to +104 °F)
Storage temperature	–20 °C to +60 °C (–4 °F to +140 °F)
Power consumption	3 W
Mass	0.6 kg (1 lb 5 oz)
Dimensions	86 x 47 x 169 mm (W/H/D) (3 1/2 x 1 7/8 x 6 3/4 inches) excluding projecting parts
Supplied accessories	No. 110 jack INCOM PGM panel (1) I/O cable (1) Operation guide (1) Maintenance manual (1)

6-3-6 Recommended Equipment and Accessories

Viewfinders

Viewfinder
1.5-inch viewfinder HDVF-150
3-inch viewfinder HDVF-30
5-inch viewfinder HDVF-500
7-inch viewfinder HDVF-75

Viewfinder accessories
Pantilt table for HDVF-75 HKCF-750

Cables

Multi-core camera cable
HDCZ-10/25

Remote control panel

Remote control panel HDCR-350

Post production system equipment

Switcher HDS-1000T
Telop camera HDST-1000T
EBR system

Digital VTR system equipment

Digital VTR HDD-1000
VTR signal processor HDDP-1000
Tape HD-1D-33A/48A/63A

Control unit

VTR control unit HDDR-1000
Audio remote control unit HDDR-A1000
Video remote control unit HDDR-V1000

Analog VTR system equipment

Analog VTR HDV-10
Tape HCT-63

Others

Digital frame recorder HDDF-500
Video disk player HDL-2000
NTSC down converter HDN-2000
Sync converter HDSC-1000

Display system equipment

Projector

HDIH-1200J/2000J/3000J
HDIR-550J

Color monitor

HDM-1430/2030/3030/4130

Black and white monitor

HDM-90/145

Design and specifications are subject to change without notice.

6-4 Glossary

Bayonet type
A type of lens mount. The lens is inserted into the lens mount and fixed in place by rotating a ring.

Black balance
To balance the black level of the R, G, and B signals so that black has no color with the iris closed.

Black set
A reference level for black balance adjustment.

CCD
Abbreviation of charge-coupled device. A semiconductor which is used in place of a camera tube. It converts light into electrical charge and outputs the electrical charge in the form of voltage variations.

CC filter
Abbreviation of Color Conversion filter. CC filters convert the color temperature to the reference value so that the same tone of a picture is obtained in the different lighting conditions.

Center maker
A cross that indicates the center of the image on the viewfinder screen.

Color bar signals
Test signals displayed on the screen as vertical stripes of different colors. Used for adjustment of hue, saturation of a video camera and video monitor.

Color temperature
The color quality of lights, expressed in Kelvins (K). Color temperature is higher when the color is reddish and lower when bluish.

DCC
Abbreviation of Dynamic Contrast Control.
A circuit that allows the video camera to accept a picture of wide luminace dynamic range.

FIT
Abbreviation of Frame Interline Transfer. A type of CCD featuring substantially reduced vertical smear.

Flange focal length
A length between the objective lens and the surface of the image.

Flangeback
Distance from the plane of lens mounting flange to the image focal plane.

Flicker
Repeated change of brightness on the screen, which is caused by frequency difference between the camera's scanning and the variations in the lighting.

Gen-lock
Abbreviation of Generator Lock. Synchronizing every pieces of video equipment to a reference (master) sync.

HAD
Abbreviation of Hole-Accumulated Diode.
A CCD sensor structure designed to suppress certain types of noise inherent to CCDs.

Horizontal resolution
Resolution of the screen in the horizontal direction. It is expressed as the number of vertical lines which can be distinguished when shooting a test chart.

Lag
Smear that follows a moving object across a stationary object. It occurs especially with color cameras and monochrome vidicon cameras at low light level.

Luminance signal
A signal that determines the brightness of the picture. Also, called the Y signal.

ND filter
Abbreviation of Neutral Density filter. ND filters reduce the amount of incident light equally across the entire visible wavelength range without affecting color.

Pedestal level
A black level which is absolute black level of a video signal. Normally, a video signal refers to the setup level (about 0 % to 10 % of video amplitude above the blanking level) as the black level.

Picture elements
Dots that compose an image. The more picture elements, the higher resolution of the picture.

Registration
Adjusting the scanning of the three G/B/R channels so that their images overlap (register) perfectly.

Return video
The video signal sent from a camera to a VTR is returned back to the camera or the video signal of the camera selected at the control unit is returned back to the corresponding camera when using two or more cameras so that a cameraman can check the picture. This video signal returned back to the camera is called return video.

S/N
Abbreviation of Signal-to-Noise ratio. The relation of the strength of the desired signal to the accompanying electronic interference, the noise. If S/N is high, sounds are reproduced with less noise and picture are reproduced clearly without snow.

Shutter speed
The length of time a shutter remains open. The higher the shutter speed, the more clearly an moving object can be shot.

SMPTE
Abbreviation of Society of Motion Picture and Television Engineers, a professional association established in the U.S.A.

Vertical smear
A bright vertical lines which appears on the screen when shooting a very bright object with a CCD video camera. Also called smear.

Video gain
Amount of amplification for video signals, expressed in decibels.

White balance
Adjustment of red, green and blue signal levels, so that white objects are reproduced correctly as true white.

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SONY®

HDC-500 Stand-alone System

HD COLOR CAMERA
HDC-500

HD CAMERA ADAPTOR
HDCA-50

HD CAMERA SIGNAL DISTRIBUTOR
HDCD-50

HD CAMERA REMOTE CONTROL UNIT
HDCR-50

SUPPLEMENT-1

HDVS
OPERATION MANUAL

HDCA-50 (WW,和/英)
0-821-504-**01**

Sony Corporation
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はじめに

このサプリメントは、メニューの項目が追加されたことに伴い、オペレーションマニュアルを補うために作られています。

サプリメントの使いかた

サプリメントは、次の構成になっています。

・前バージョンとの違い

・差し替え用のページ

差し替え用のページは、ページ番号を参照して、オペレーションマニュアルの対応するページと差し替えてください。

例

サプリメントに3-21、3-22がある場合

オペレーションマニュアルの3-21、3-22と差し替えます。

サプリメントに含まれているページ

このサプリメントには、以下のページが綴じられています。

3章：3-15～3-16、3-21～3-24

前バージョンとの違い

以下の機能が追加されました。

メニュー設定の追加

D56： メニューをONに設定することにより、電気的に色温度5600Kの色バランスが得られるようになりました。

このメニューの追加にともない、色温度5600Kのブラックバランスの自動調整もできるようになりました。

Information on this Supplement

This manual, supplement-1 for the HDCA-50 Stand-alone System, contains information on the newly added menu set-up item.

How to use this supplement

This supplement consists of the following two main parts.

- Pages explaining any differences from the previous version.
- Pages to be inserted into your operation manual

Insert the pages, listed below, into your HDCA-50 operation manual. Discard the pages they replace.

Example

When the supplement contains pages 3-21 and 3-22
Replace pages 3-21 and 3-22 of the HDCA-50 operation manual with the new pages supplied in this supplement.

Pages provided with this supplement

This supplement contains the following replacement pages.
Chapter 3: 3-15 to 3-16, 3-21 to 3-24

Differences from Previous Version

The following functions have been added.
Additional menu set-up item
D56: Obtains the 5600K color balance electronically by setting the D56 menu item to ON.
Also automatically can adjust the 5600K black balance due to addition of this menu set-up item.

Pages to Be Inserted into Your Operation Manual

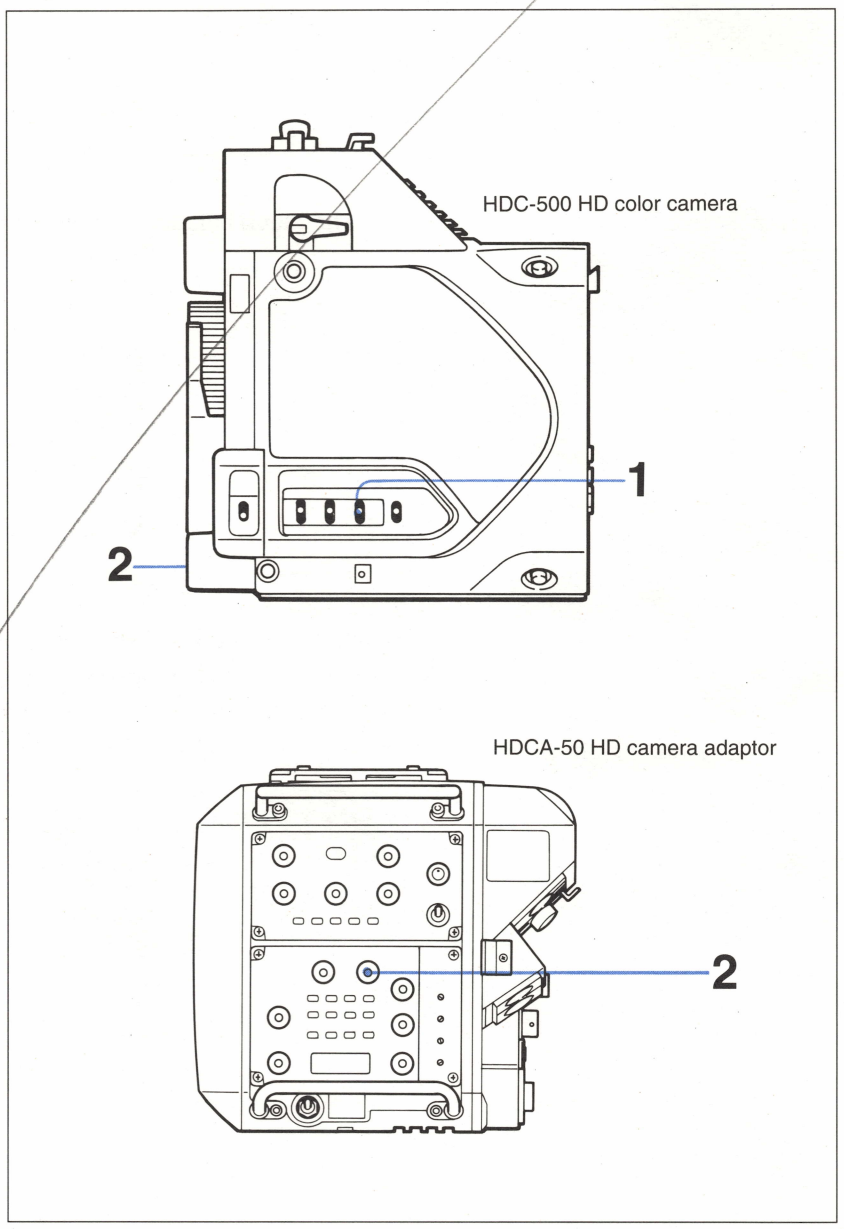
Insert the following pages into your HDCA-50 operation manual.
~~Discard~~ the pages they replace. ARE ATTACHED.

1 JUN 94

PREVIOUS VERSION - REPLACED BY SUPPLEMENT 1-6-94

Automatic black balance adjustment

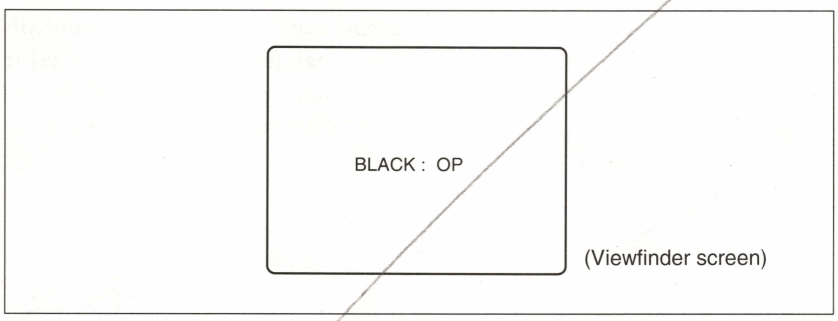
You can adjust the black balance automatically from the camera, the camera adaptor or remote control unit. Manual adjustment of the black balance can be performed from the remote control unit.
For details of making an adjustment from the HDCR-50 remote control unit, refer to subsection "5-1-1 Automatic/Manual Black Balance Adjustment."



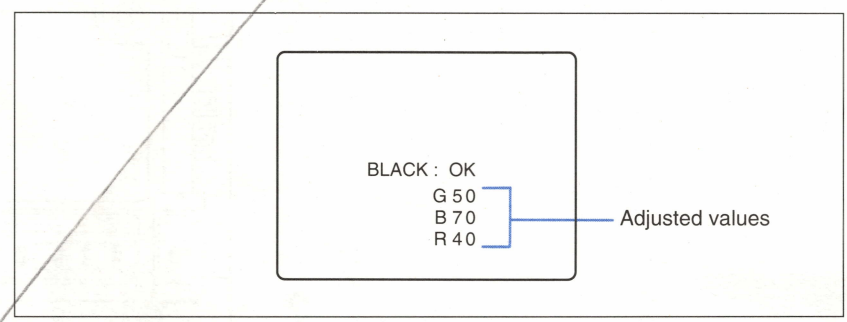
Automatic black balance adjustment

1 Set the OUT (output signal/dynamic contrast control) switch of the camera to CAM.

2 Press the adaptor's AUTO BLACK button or set the camera's AUTO W/B BAL switch to BLK.



The black balance is adjusted automatically.



Black balance adjustment is completed within a few seconds and the settings are automatically stored to memory. If any of the following messages are displayed in the viewfinder, automatic adjustment fails. In this case, perform manual adjustment.

Error message	Possible causes
OUT OF RANGE	The level is beyond the adjustable range.
TIME LIMIT	Focusing cannot be done within the time available.

PREVIOUS VERSION - REPLACED BY SUPP. 1-6-94

Adjusting the horizontal phase (H PHASE)

You can adjust the horizontal phase for external synchronization either from the camera adaptor or from the camera signal distributor.

Adjusting from the camera adaptor

Use the H PHASE control to adjust the horizontal phase.
You can shift the adjustment range of the H PHASE control with the internal volume control.
For details of how to set the internal volume control, refer to the maintenance manual supplied with the stand-alone system.

Adjusting from the camera signal distributor

Use the H PHASE switch and control on the sub-panel.

1 Make sure that the ACTIVE lamp is lit.
2 Set the H PHASE switch to CTL.
3 Adjust the horizontal phase with the H PHASE control.
4 Set the H PHASE switch to LOCK.

Adjusting the master black

The master black adjustment, corresponding to the contrast adjustment for a video monitor, is required mainly in the following cases.

- When adjusting the black gradation
- When the reference black level is required for the cameras constituting a multi-camera system.

You can adjust the master black level with the BLACK control of the camera adaptor or the MASTER BLACK dial of the remote control unit. The black level of each R, G, and B channel changes simultaneously.

3-5 Menu Operation

3-5-1 Menu Set-Up Item

You can set and display the following five items from the system menu.

- **VF IND (viewfinder indication)**
Switches the display mode of the viewfinder screen. To erase a display, select the same mode again.

- **VF MARKER (viewfinder marker)**
Selects the picture frame displayed on the viewfinder screen. To erase the frame, select the same mode again.

- **CLS (clear scan for continuous increment and decrement)**
Sets the fine shutter speed.

- **READOUT SEL**
Switches the CCD readout mode.

- **ZEBRA**
Selects the zebra pattern display mode.

Menu	Setup/display item	Contents
VF IND	FILTER	Displays the number of the selected filter.
	TAPE	Displays the remaining amount of the tape. (Only when a VTR is connected)
	VOLTAGE	Displays the input voltage of an external DC power source (ex. battery).
	SHUTTER	Displays the shutter speed. To set the shutter speed, select this mode.
	EVS	Displays the Super EVS mode number. To set the number, select the READOUT SEL menu.
	GAIN	Displays the gain. To set the gain, select this mode.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
VF MARKER	CENTER MARKER	Displays the center marker on the viewfinder screen.
	4:3 FRAME	Displays a picture frame having a 4:3 aspect ratio.
	SAFETY ZONE 1	Displays the safety zone (effective screen) of the camera for shooting. (95%)
	SAFETY ZONE 2	Displays the safety zone (effective screen) of the camera for shooting. (92.5%)
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.

PREVIOUS VERSION - REPLACED BY SUPP. 1-6-94

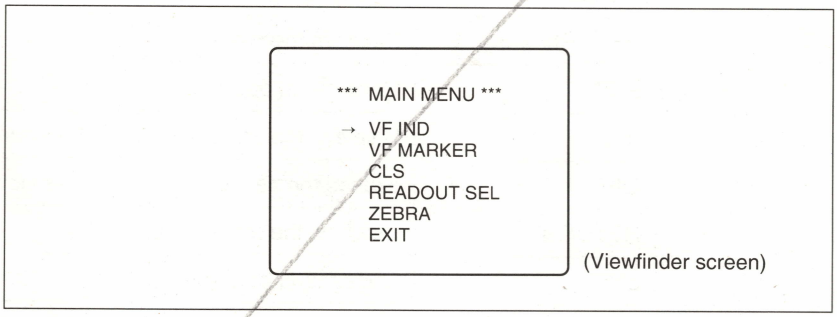
Menu	Setup/display item	Contents
CLS	FASTER(UP)	Sets a faster shutter speed.
	SLOWER (DOWN)	Sets a slower shutter speed.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
READOUT SEL	EVS	Sets the number of the Super EVS (enhanced vertical definition system) mode.
	FIELD	Selects the field mode.
	FRAME	Selects the frame mode.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.
ZEBRA	ON	Displays the zebra pattern in the viewfinder.
	OFF	Erases the zebra pattern from the viewfinder.
	RETURN	Displays the main menu.
	EXIT	Quits menu operation.

3-5-2 Menu Operation

Perform the following to set menu items from the camera.

1 Set the OUT (output signal/dynamic contrast control) switch to BARS DCC ON.
Color bars are displayed on the viewfinder. (Color-bar mode)

2 Set the AUTO W/B BAL switch to WHT.
The main menu is displayed in the viewfinder. (Menu mode)



(Viewfinder screen)

3 Move the cursor to the desired item by turning the AUTO W/B BAL switch toward:
WHT : ↑ (moves up)
BLK : ↓ (moves down)

4 Press the VTR STR button to select the desired item.
The selected sub-menu appears in the viewfinder.

5 Move the cursor to the desired item by turning the AUTO W/B BAL switch toward:
WHT : ↑ (moves up)
BLK : ↓ (moves down)

6 Press the VTR STR button to execute the selected item.
The executed item is displayed in the viewfinder.

7 To continue, select RETURN to display the main menu. Repeat steps 3 to 6 to set other items.
To quit, select EXIT.